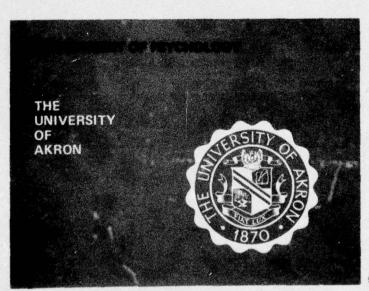
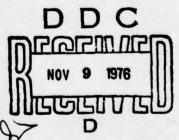




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Technical Report 6

The Relationship Between Individual
Attributes and Job Design:
Review and Annotated Bibliography

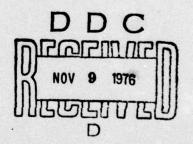
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#### Abstract

Annotated bibliography, review of literature, and glossary of terms related to current and past trends in job design. The following topics are included: Quality of Work Life: Conceptual and Theoretical Framework for Job Design; Measurement of Tasks and Job Structural Attributes; Survey Case, Field, and Laboratory Studies of Job Design; and Interaction of Individual and Group Variables with Job Design.

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#### CHAPTER I

#### INTRODUCTION

In the last ten to twenty years there has been increased public and professional concern regarding the quality of work life and the consequences of job design for the individual, the organization and society in general. This concern has been accompanied by a massive outpouring of theoretical and action research designed to attack the problem. ) An ever increasing voluminous body of literature has been produced by these concerns and is scattered in a variety of references and sources: technical journals, government documents and reports, unpublished reports, symposium proceedings, newspapers and magazines. A number of different disciplines have been engaged in both research and professional applications. These include Psychology, Sociology, Engineering, Economics, Political Science, Business and Management. This probably accounts for the large number of diverse concepts, theories, operational definitions and measuring instruments which have been applied to the same set of problems. need was seen to attempt to draw together some of the literature in one place to provide an index for practitioners and researchers from a number of disciplines and a variety of academic and professional This review and annotated bibliography attempts to fill this need and reflects this diversity which characterizes the field.

### Historical Perspective

At the beginning of the industrial era, attention was focused on working conditions in terms of the health and safety of the worker. As these physical conditions of work improved, concern

developed regarding the attitudes of workers toward their jobs. In the 1930's, a reaction against mass production and principles of scientific management began to form. The assembly line technology, in which man had lost control over his work, the method and the pace of work, were contrasted with the idealized model of the craftsman who controlled his own work and could take pride in the fruits of his labor. Charlie Chaplin's vivid portrayal of the pathetic and harassed assembly line worker in "Modern Times" was an artistic expression of these problems. Social critics concluded that a man's work should be meaningful and a source of satisfaction. These issues led to literally thousands of job satisfaction surveys (Bass & Barrett, 1972). An early example of this kind of survey is represented by the work of Kornhauser and Sharp (1932).

In the effort to increase production for the war, these issues were temporarily laid aside and did not emerge again until the 1950's. At that time a number of researchers concluded that automation and specialization had created a dire situation for the industrial worker. Mass production and assembly line technology had so fragmented and specialized the task that the worker was bored by the monotony and repetitiveness of his work. The consequence of this boredom was an attitude of pervasive worker discontent resulting in problems of increased absenteeism, high labor turnover, restriction of production and decreased quality.

Roy (1951-1952), using a participant-observer technique, examined the productive behavior of industrial workers and found that groups of workers were engaged in a variety of techniques to restrict production day in and day out. Whyte's (1955) study of "quota

restricters" related restriction of production to cultural and group variables in that urban workers restricted production while rural workers did not. Walker and Guest's (1952) classic study of men on the assembly line clarified the problems of the auto worker in the automated factory. The study consisted of interview data from 180 auto production workers selected from a total work force of 1068. The average age of the sample was 27, and 49% were high school graduates. In looking at the previous job experience of the sample, about 75% had worked at manual jobs before working at the auto factory; 87% of the men had come from jobs where the work pace was self-determined; 72% had held jobs which were not repetitive; 69% had jobs which required more skill and 63% held jobs in which they had some degree of freedom in determining the job method as well as the tools and materials to be used. In contrast to their previous job, their current jobs on the auto assembly line could be described by the following characteristics: mechanical pacing of work, repetitiveness, minimum skill requirements, predetermination in the use of tools and techniques, minute subdivision of product worked on and surface mental attention (Walker & Guest, 1952, page 12).

Walker and Guest concluded that absenteeism and turnover were higher for jobs where mass production characteristics were more pronounced. Union membership was found to be based not only on economic considerations but on psychological factors as a defense against boredom and the impersonality of management. Production line jobs varied in complexity; and as a general rule as the number of operations a worker performed increased, the variety of job contact increased. The most disliked features of assembly line jobs were

the mechanical pacing, the repetitive nature of the job, and the low skill level required. In comparing their present auto jobs with their previous work, the workers liked the pay and security of their present work but disliked the job content. Over 80% of the workers obtained jobs on the auto assembly line for economic reasons.

The social relationships between workers in an assembly plant were found to be affected by technological and plant layout features. Walker and Guest concluded that the auto assembly line limited social interaction among workers to a loose work group whose members were related by spatial proximity and not by mutual cooperation in the work process. The line also created a few isolates who enjoyed no interaction. Noise, speed of the line and the amount of physical energy and attention required limited social interaction. These problems also contributed to dissatisfaction with the work itself.

Other field and interview studies in the 1950's concluded that mass production technology had created problems for the worker.

Walker and Marriott (1951) reported in an interview study of 976

men from three large factories that more than a third of the workers complained of boredom on the job. Boredom was found to be more pervasive if the men had previously held a skilled job. Guest (1955), in a study of 18 men who quit their assembly line jobs after 12-15 years on the job, concluded that even after years of experience, men never adapted to highly rationalized, mechanically paced work. Of the 18 men who quit their assembly line jobs, only three men went back into factory work but not to jobs of a repetitive conveyor type. Other researchers concluded that mass production technology had

stripped work of its meaning and disturbed required social interaction among workers (Guest, 1955; Faunce, 1958b; & Turner, 1955).

Job simplification was also viewed as the cause of poor mental health of the worker (Kornhauser, 1965).

#### Current Conditions

In the 1960's and 1970's, the popular press and the media focused on a new national illness - "the blue collar blues" or the "Lordstown Syndrome." According to these sources, most American workers are bored, frustrated, and rebellious; frequently they are drunk on the job or "stoned" on drugs. Absenteeism and turnover are reported to be running at all-time high rates, and productivity is at its lowest rate (Business Week, 1972b; Faltermayer, 1974; Gooding, 1970; Life Magazine, 1972; McKenna, 1972; Norcross, 1974a, 1974b; Newsweek, 1968, 1973; Northrup, 1974; U. S. News and World Report, 1972; and Vinocur, 1972).

In 1971, a ten member task force was appointed by Elliot L. Richardson, Secretary of Health, Education and Welfare to conduct a broad study of the quality of work life. In 1973 their report was published and concluded that although the work ethic is alive, a large number of American workers at all occupational levels are pervasively dissatisfied with work. Their conclusion was that the principle sources of discontent are work specialization and diminished work autonomy. The behavioral results are decreased productivity and quality, increased labor turnover and absenteeism, and a number of work related physical and mental problems of workers. (U. S. Department of Health, Education, and Welfare, 1973).

Sheppard and Herrick (1972), in a book entitled Where Have All the Robots Gone?: Worker Dissatisfaction in the 70's, reported the results of interview data from approximately 400 male blue-collar workers in Michigan and Pennsylvania and a national sample of 1533 employed workers. The authors concluded from their interview results that dissatisfaction with job content and the work itself were wide-spread, encompassing up to 30% of the work force. These attitudes of dissatisfaction were most prevalent among young workers with some college, black workers, and females under age 30. Workers who rated their jobs high in variety, autonomy, and/or responsibility were much more frequently satisfied with their jobs. Sheppard and Herrick warn that this widespread dissatisfaction can lead to socially, economically, and politically destructive behavior.

Survey results from other investigators produce conflicting results depending upon the demographic characteristic of the sample and the nature and phrasing of the survey questions. The assumption of pervasive worker discontent has been challenged by some. For example, Wool (1973) reported that only 20% of the work force is dissatisfied and that the quality of work life movement must take into consideration economic security, inflation, unemployment, and broader economic and social issues. Kaplan (1973) reported that according to Gallup Polls, job satisfaction actually increased over the last two decades; and that while there are pockets of dissatisfaction and alienation among segments of the labor force, the majority of workers appear to be satisfied with their work. Others point out that job enrichment and work restructuring programs have been success-

fully applied in countries with a tight labor market and that researchers and practitioners have failed to consider broader economic conditions and individual differences among workers.

A recent and comprehensive review of national surveys of American workers was completed by Quinn, Staines, and McCullough in 1974. They reviewed seven national surveys of workers conducted since 1958 by the National Opinion Research Center and the Survey Research Center of the University of Michigan and California. They also supplemented their data with information from eight National Gallup Polls. The results of this extensive review indicate the following: there is no evidence of a widespread decline in overall job satisfaction from 1958-1973 (about 15% of workers are dissatisfied); job satisfaction is lower among blacks, younger workers, operators, laborers, service and clerical workers, women with young children, workers with some college but no degrees; most workers rated having the resources to perform their jobs well and challenging jobs as more important than financial reward; blue-collar workers rated pay higher than job challenge; women workers were more concerned with comfort factors than men; job satisfaction has not been directly linked to productivity, but it has been related to absenteeism, alcohol, drug abuse, sabotage and theft; most recent experiments in job redesign have been conducted too unscientifically to permit any reliable estimation of their success. The report concluded that in spite of the lack of a nationwide trend of increasing job dissatisfaction there is evidence that points to a number of job related problems in American society.

Two national surveys (1969-1970 and 1972-1973) of working conditions conducted by the Survey Research Center, University of Michigan give detailed information regarding the importance of various job facets to workers and the worker's perception of the degree of variety, autonomy, repetition, skill required, and other attributes contained in his job (Quinn & Shepard, 1974). A cluster analysis defined the following six dimensions of job satisfaction: comfort, challenge, financial rewards, promotions, relations with co-workers and resource adequacy. The survey concluded, in comparing working conditions between 1969 and 1973, that things were not getting any worse, but the questions remained as to why they were not getting better.

The few bright spots that emerge in comparisons of the 1969 and 1973 data are mainly confined to financial matters. At the same time increasing numbers of workers are becoming locked into their jobs, however good or bad these jobs may be. Moreover, most of the major experiments and reforms undertaken during these three years have had little aggregate impact on the work force at large. While the women's movement may have helped make women more conscious of sex discrimination, wage inequities between men and women remain unchanged. Experiments with working hours, job enlargement and job enrichment have been frequent and certainly well publicized. The data indicate that they have made no appreciable impact on national statistics.

Knowledge that the sky is not really falling should not heed complacency. More sobering is the question of why the sky is not any higher than it used to be (pages 261-262).

Other large scale surveys are summarized in Table 1 Survey Studies: Job Attitudes and Job Design, page 103 of this report.

#### Job Design Efforts

Job design to enrich and enlarge jobs has been advocated as the panacea for the ills of the modern worker. The term job enlargement

was first used by Charles R. Walker in 1947. One of the earliest published accounts of a major corporation utilizing job enlargement was IBM in 1943-1944 (Gifford, 1972).

Job enrichment and enlargement are diffuse concepts which have been broadly interpreted to include a variety of industrial and management programs: participative management, decentralization, democratic leadership, management by objective, vertical and horizontal job loading, autonomous work groups, and reduction of supervision.

A number of job enrichment projects have been conducted since the early IBM studies in 1943-1944. These field and case studies are impressive in the number of attempts by industry to enrich jobs. However, many of these studies have not used acceptable methodology, control groups, or statistical analysis. However, in spite of these limitations, the job enrichment movement in industry represents a twenty to thirty year effort to improve the quality of work life in order to achieve desired organizational goals. Many major corporations have been involved including AT & T, IBM, Texas Instrument, Imperial Chemical, General Foods, Travelers Insurance, General Electric, and Detroit Edison.

Job enrichment programs have involved a variety of workers at all job levels ranging from janitors to research scientists. The changes have been diverse and have included: the establishment of autonomous work groups, redesign of assembly and clerical jobs to include a complete module of work and the combination of set up, production, quality control, and maintenance functions. The results of job enrichment projects usually indicate improved quality and in-

creased worker satisfaction and in some cases increased productivity.

Recently a few job enrichment failures have been reported in the

literature (Frank & Hackman, 1975). In addition, pilot job design

projects of the 1960's have not diffused or been adopted throughout

eight major organizations (Walton, 1975).

The evidence indicates that these projects have not had a major impact on the work force and have lacked the experimental rigor to make a scientific contribution.

### Quality of Work Life

The early job enrichment movement of the 1950's and 1960's led in the 1970's to a broadly based movement that questioned the basic rationalization of the industrial era that a dehumanized work life was the inevitable cost and consequence of acquiring material rewards and maintaining the high standard of living achieved by western industrialized nations. This movement has been labeled the "quality of working life" and has evolved from a number of political, economic, and social issues. Davis, Cherns and Associates (1975a) enumerate five salient issues of the 1970's which concern the quality of work life movement. The first issue is the growing number of individuals who will not accept alienation or dehumanized work as a consequence of a productive society. Second, industrial culture and negativism is spreading to the service sector encroaching on personal services and professional jobs with negative consequences for workers as well as clients. In addition almost 60% of the U. S. work force is now in the service sector. The other issues involve the availability of jobs, development of flexible people and organizations to adapt to rapid changes in technology and providing means

for the disadvantaged and powerless to both enter and progress in the main stream of the economy and society. The basic job design question is how can work be humanized and what constitutes "quality?"

Four basic principles are seen as underlining the humanization of work (Davis, Cherns, & Associates, 1975a). The first is the principle of security which implies the worker's need to be free from fear and anxiety concerning health, safety, income and future employment. The second principle of equity involves adequate compensation to the worker for his contribution to the value of a service or a product. This principle according to some would involve profit sharing. To others it would involve differential reward to individual workers on the basis of what they know and what they can do rather than on the basis of their specific job title or level, or job classification. The third principle of individuation assumes that work should provide the mechanism for individuals to develop, learn, and use their unique abilities. Individuation involves a rekindling of the earlier craftsmanship concept in which a worker had maximum autonomy. The fourth principle of democracy involves replacing authoritarian-hierarchical control with cooperative selfmanaged groups. Where supervisors are necessary it is suggested that they be elected by the group.

These four principles on the surface read as deceptively simple prescriptions for curing the ills of the work place. Implementation seems to be the problem, and some would argue that the four principles would in practice contradict one another (e.g., equity and democracy). Cherns (1975) reviews criticisms and basic assumptions of the quality of working life movement which include the existence of a social-technical system and the assumption that workers have needs which must be satisfied in their work. Associated with these assumptions are certain values of autonomy, high skill level, learning and a high degree of self-investment in work which offers opportunities for growth and self-actualization. Cherns, in considering the quality of work life from a cross cultural view, believes that development of the quality of work life movement will actually change the whole meaning of the concept of work and work satisfaction and that satisfaction as we know it today may actually decrease as work gains in centrality and importance to an individual's well being.

#### Recent Perspectives

Two recent books have reviewed the relationship of job satisfaction and productivity (Srivastva, Salipante, Jr., Cummings, Notz, Bigelow & Waters, 1975; Katzell, Yankelovich & Others, 1975).

Srivastva et al. (1975) reviewed over 600 correlational and field studies completed within the last fifteen years. They concluded from the correlation studies that the theme of autonomy emerges as a significant organizational factor related to both satisfaction and performance. Other conclusions from the correlation studies were as follows: the intrinsic nature of the work itself is positively related to satisfaction and negatively related to absenteeism and turnover; autonomy is positively related to satisfaction and performance; democratic supervisory style is positively related to satisfaction but may either be positively or negatively related to performance; supportive supervisory style is positively related to

satisfaction; organizational climate (reflecting support, open communication and autonomy) is positively related to satisfaction and in most cases to performance. The authors also point out that these relationships between organizational factors and outcome variables are contingent upon other factors within the worker, the organization, and the environment as a whole.

clusions: (1) socio-technical changes toward making work groups more autonomous are likely to result in increased satisfaction and performance when groups are provided with a whole complete task, work discretion, feedback, and variety of task skills; (2) job restructuring results in increased performance and satisfaction if individual workers are provided with autonomy, task variety, and feedback; (3) participative management results in increased satisfaction; (4) organization change which reduces hierarchical levels, increases span of control and introduces new line and staff positions which lead to increased productivity.

Katzell, Yankelovich and others (1975) evaluated research dealing with features of work which affect both the productivity and job satisfaction of employees. They concluded from their review of the literature that limited programs such as job enrichment, worker participation or incentive pay will not by themselves create substantial or long range improvement in satisfaction or productivity. Complete redesigned socio-technical work systems will result in improved productivity and satisfaction if the system includes the following components: financial compensation based on performance, matching of workers to jobs, challenging work for workers who desire

it, worker participation, adequate resources to carry out the job, and adequate hygiene conditions. They concluded that a coordinated drive by industry, government, research and consulting agencies is necessary to attack problems of productivity and satisfaction.

Other review articles are summarized in Table 2 Major Review Articles: Job Design, Job Enrichment, Organizational Structure and Climate, Quality of Work Life, Work Attitudes, and Outcomes.

#### Organization of Report

This report considers the quality of work life from a job design approach. The focus concerns those variables which influence job design, including the task, the worker and the organization.

The following topics will be reviewed in succeeding chapters: conceptual and theoretical basis of job design, measurement of job structural attributes and tasks, survey research dealing with job design, case studies, field studies, laboratory studies, interaction of individual and group variables with job design, and a summary and conclusions chapter. The narrative section is followed by abstracts of all references.

The abstracts were derived from three sources: summaries written by the author of the article or book, abstracts that appeared in <u>Psychological Abstracts</u>, and summaries written especially for this review by the authors of this report.

The last section contains a glossary of terms commonly used in the job design literature. The definitions are included in an attempt at clarification of concepts and as an aid to the reader.

Each term is defined as clearly as possible and may include a reference or references in which the term or concept is discussed, defined, or used as a research variable.

In summary, this review is an attempt at integration of a diverse body of literature. The criterion for inclusion of articles is primarily subjective in that many of the articles included represent those articles collected by the senior author over a period of years. The articles are somewhat biased by the authors' discipline and theoretical orientation. A majority of the articles are from psychological journals, but other disciplines are represented and included. This report should be used and viewed as a starting point for those researchers to complete an in-depth review of a particular topic or experimental variable. The authors apologize both for sins of omission and commission.

#### Summary Statements

- (1) Job design in the twentieth century has passed through a number of phases including an early focus on working conditions, scientific management and work simplification, assembly-line technology, job enrichment, and a broadly based quality of work life movement.
- (2) These phases have resulted in shifts in emphasis and focus from the machine to the human element, from work tools and methods to work content or the work itself, and from management goals of profit and loss to joint organizational and human goals.
- (3) The basic principle of the quality of work life movement is that it is possible to simultaneously meet organizational goals and human aspirations in the work place.
- (4) There are segments of the population who are dissatisfied with their work, and there are problems in work related areas of productivity, quality, absenteeism, as well as social, political, economic and health problems.

(5) There is little evidence indicating that these problems have increased in recent years or that there has been any substantial progress in improving the quality of work life.

#### CHAPTER II

#### CONCEPTUAL AND THEORETICAL FRAMEWORK FOR JOB DESIGN

#### Major Trends

A number of major historical themes and trends have characterized the various approaches to job design. In the 1800's, the field was concerned with how much physical work a man could perform in a stated period of time. Work output was often compared with that of a horse, and physical demands were considered to be the most important factor in job design. In the early 1900's, under the influence of Taylor and Gilbreth, this concern with the physical capacity of the worker was extended to include simplification of the task and the "one best method" to perform each individual job (Gilbreth, 1911; Taylor, 1911). These pioneering studies were the beginning of time and motion studies. The early concern of these studies was physical exertion, and later, the effects of fatigue and rest periods on task productivity.

Attention then focused on the proper design of tools, equipment, and the work space to improve efficiency and productivity. The industrial engineering approach of Barnes (1968) emphasized the principles of motion economy which centered on the proper arrangement of work space, design of tools, and body movements during work.

During World War II, the emphasis of job design was shifted from a concern with physical work to mental work. New sophisticated man-machine systems required little physical exertion but did involve complex levels of sensory, perceptual, and decision-making abilities. During the war, a group of Air Force psycholo-

gists started to apply the methodology and principles of experimental psychology to the design of man-machine systems for the military. This work involved the early design of dials for displaying information. This group of Air Force psychologists represented the beginning of the human factors or engineering psychology approach to job design and includes the current work of Chaney and Teel (1967) on inspection tasks. The work of human factors investigators ranges in scope from display and control devices to monitoring complex automated equipment and computer operations.

In the early 1940's, simultaneous with the growth of the human factors aspect of job design, a movement began in reaction to the early work simplification and industrial engineering approach of Taylor and Barnes. The Hawthorne studies clearly demonstrated the effect of worker participation in job design and worker attitudes on production (Roethlisberger & Dickson, 1939). In the 1950's, the work of Walker and Guest (1952) centered on the repetitiveness and monotony of assembly-line factory work. of job design shifted from work simplication and work specialization to job enlargement. Herzberg (1966, 1968), in the 1960's, formulated his two-factor theory of work motivation and concluded that extrinsic variables would not motivate workers and that intrinsic factors in job content should be increased by job enrichment. This theory led to a variety of studies and theories regarding the nature of intrinsic motivation. All of these early job design approaches of Taylor, Barnes, and Herzberg viewed the worker as a general entity with common motives, drives, and abili-These approaches minimized the role of individual differences. The sociological approach to job design focuses on group differences as they interact with job design. This theoretical trend, according to Davis and Taylor (1973), stems directly from the sociological concepts of bureaucracy as developed by Weber and Marx's construct of alienation. Turner and Lawrence (1965) and Blood and Hulin (1967) have taken this approach and have found that satisfaction and productivity appeared to be a function of the interaction between the job design and group membership. Specifically, the rural worker tended to prefer a more responsible, larger job, while the urban worker appeared to favor the reverse. Here, for the first time, was an explicit statement of the interaction between worker characteristics (shared culture) and job design. This research, however, still did not deal with the interaction of individual abilities and attributes with job design.

The psychological theory of motivation, as formulated by Maslow (1943, 1965) provided the framework for recent job design approaches which center on the individual needs, motives, and perceptions of the worker. Hackman and Lawler (1971) formulated a theory based on the effects of higher order need, satisfaction, and job content on job outcomes. This early work led to a new theory of job enrichment which includes job content, critical psychological states, and work outcomes which are moderated by a worker's growth need strength (Hackman, Oldham, Janson, & Purdy, 1975).

Another current model of job design includes not only individual perceptions and motives but also the individual's ability to perform the job and other individual attributes as they interact with job design. This model encompasses the work of Fleishman (1975) in the area of an ability task taxonomy and the research of Lofquist and Dawis (1969) on the effects of ability on job satisfaction and performance. This approach has been followed by Barrett and his associates (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975). Theoretical models have been proposed by French and Kahn (1962), Betz, Weiss, Dawis, England, and Lofquist (1968), and Lorsch and Morse (1974).

Other job design research models combine job design with the concepts of organizational development or management by objectives. This approach looks at a wide variety of techniques to improve the quality of work and the profit margin of a company. This involves unified organizational change over time and represents an eclectic-utilitarian approach to job design. The work of Huse and Beer (1971), Odiorne (1975), Sorcher and Meyer (1968), and Walton (1972a, 1972b) are examples of this conceptual school of thought.

A final approach to job design which derives its impetus from the early small group research of Kurt Lewin is represented by the work of Davis in America and the Tavistock Institute in England. Davis (1966, 1970, 1971) views job design as a complex field involving organizational, technical, and personal aspects. The goals of job design, according to Davis, include satisfaction of organizational task requirements and human requirements. The socio-technical theory of job design of the Tavistock Institute focuses on the relationship between technology, organizational structure and human interactions in work groups. The English and

European socio-technical system has contributed to our understanding of the role of semi-autonomous work groups in job design.

This chapter will review each of the following conceptual frameworks of job design: (1) Taylorism, or scientific management, (2) industrial engineering, (3) human factors, (4) activation theory, (5) intrinsic-extrinsic job factors, (6) sociological approach, (7) job design for higher order needs--expectancy theory, (8) congruence approach, (9) organizational development, and (10) socio-technical systems approach. Each theoretical position will be described, and a few studies will be included to illustrate important points. It is not within the scope of this review to include all the research evidence pertaining to a particular theoretical position, nor to evaluate each theory in depth.

## Taylorism and Scientific Management

In 1898, Frederick W. Taylor began a series of empirical studies at the Bethlehem Steel Company to determine the best method of shoveling. After four months of experimentation, he concluded that a 21-pound shovel load was optimal. He also empirically tested different types of shovels. The company selected and trained workers according to Taylor's specifications, and subsequently, handling costs dropped from 7 to 8 cents a ton to 3 to 4 cents. The workers received increased wages as an incentive for conforming to the prescribed work methods (Taylor, 1911).

These studies represented the beginning of Taylor's philosophy of scientific management. Scientific management consists of a series of steps in planning and controlling work and work methods. First, management must develop a science for each part of a man's work which replaces the old rule of thumb. According to Taylor, this can be accomplished by a simple analysis and time study of the movements of 10-15 different but skilled workmen, and it only requires a stop watch and a properly ruled notebook. From this analysis, you can select the best and quickest method of working, as well as the most efficient implements or tools. This is accomplished by eliminating all unnecessary movements. This one best method then replaces the previous 10-15 different haphazard methods of working and becomes the standard work method. This method is taught first to foremen and then to every worker. It is used until it is replaced by a quicker or better method. Taylor believed that the development of a science of tasks could be done by men without scientific training. He also felt that management should scientifically select and train workmen. Workmen would then be given incentive pay to work in the standard way. It was management's responsibility to provide the worker with proper tools, working conditions, and materials to perform effectively. Taylor envisioned a spirit of cooperation between management and the worker. He believed in an equal division of work between management and the worker. Management should plan out the task or work at least one day ahead of time and present it to the worker in written form. The written instructions include the task and method of task completion. If the worker had a definite task to perform and a clear-cut standard to meet, he would achieve more satisfaction than working under a system of no training or no clear idea of how to work. Taylor's approach

involved careful experimental analysis and evaluation of the "one best method" of working. Taylor's followers replaced this careful systematic evaluation with observation, or even in some cases, intuitive non-empirical decisions.

Gilbreth's careful study of bricklaying resulted in reducing a worker's movement in laying one brick from 18 to 5 movements with increased production from 120 to 350 bricks per hour (Gilbreth, 1911). Gilbreth's approach involved the elimination of wasted movements in work by the design of equipment and the proper placement of materials and tools. Gilbreth invented a scaffold that could be raised or lowered so that the worker could always be working at the most comfortable level to eliminate stooping. The blame or credit for job specialization can be assigned to Gilbreth. He supplied the bricklayer with a helper who sorted and supplied bricks to the bricklayer. Gilbreth's methods eliminated wasteful movements, transferred simple parts of the work to a helper, and involved the use and design of labor saving equipment.

#### Industrial Engineering

The Industrial Engineering approach has built on this early work of Taylor and Gilbreth and has concentrated its efforts in job specialization, tool arrangement, the design of conveyors and tools to replace hand transfer methods, and other techniques to reduce fatigue and the physical effort expended by the worker.

This approach attempted to formulate and test various general principles of motion economy. As a result of this work, Barnes (1968) has formulated 22 principles of motion economy.

Another conceptualization by Lehrer (1958) formulated broad principles of job design geared to the entire work system and including the human values of work. These broad principles include the following: (1) conservation of energy (increase the amount of useful work accomplished by the energy in the work system), (2) goal recognition (every individual should understand the objectives of his organization), (3) dignity of work activity (work should provide means for each individual to express his individuality and creativity), (4) self-determination (sharing the responsibility and authority for on-the-job methods), (5) work elimination (eliminate those activities that are not productive), (6) smooth and balanced flow (physical flow of materials, parts, and information should be smooth, balanced, and properly time-phased), (7) effectiveness (combination of work parts and units), (8) simplicity and directness, (9) standardization and pre-planning (standardization should incorporate individual differences), (10) quantitative evaluation (results of the work method should be evaluated), (11) proper installation (participation by workers and supervisors in change), and (12) dynamics of change (continuous evaluation of the system).

In addition to specifying principles of job design, the industrial engineering approach has stimulated research in the following areas: paced systems of production (Belbin & Stammers, 1972), batch size, cycle time and assembly lines (Cox, 1970; Cox & Sharp, 1951; Hill & Thicket, 1966; Harding, 1931; Kilbridge, 1960a, 1960b; Smith & Lem, 1955; Van Beek, 1964; Wild, 1975), and monotony and fatigue (Gilbertova & Benes, 1970; Smith, 1953, 1955; Van Beek, 1964; Wild, 1975).

The industrial engineering school emphasizes motion economy with the reduction of fatigue by replacing hard physical human labor with automated equipment. A number of cases in the literature have indicated that automation of factories has led to negative consequences for the worker in terms of his social status and his relationships with other workers. In the comparison of an English milling factory before and after automation, it was found that many of the mill workers preferred the old system (Chadwick-Jones, 1970). Even though automation had made their work easier, it also involved the workers' loss of control over his work and the selection of work partners. In the old mill, there was a self-selection of work group members, production standards, work methods, and work roles. Similar cases of some negative consequences in automation are reported in the coal mining industry (Trist, Higgin, Murray, & Pollock, 1963; Trist & Bamforth, 1951), in office work (Dunlop, 1962), a power plant (Mann & Hoffman, 1956), and a pipe mill (Walker, 1957).

Another point of contention is the economic and social value of the one best method and job specialization. The debate over job specialization has lasted for over forty years. As early as 1931, Harding studied two inexperienced workers soldering wires. He found that the two workers preferred a larger unit of work as it was more interesting, time went faster, and they were less tired. Guest, in 1955, warned that in carrying mass production to the extreme, industry had stripped work of all its meaning and value to the individual.

A number of other investigators have concluded that functional specialization is negatively related to job satisfaction and other work attitudes (Alderfer, 1967; Armstrong, 1971; Fullan, 1970; Shepard, 1969, 1970, 1971; Susman, 1970a, 1970b).

Kornhauser (1965) has blamed job specialization and simplification for the general overall poor mental health of industrial workers. He found, in a study of 655 auto workers, that indications of poor mental health increased as job level decreased from skilled to semi-skilled to repetitive work.

In reviews of the literature in job specialization, Warren (1958) and MacKinney, Wernimont and Galitz (1962) concluded that the issue was far from being settled, and that there were few empirical controlled studies comparing specialized jobs with enlarged or enriched jobs. They stated that the benefits of larger or enriched jobs were still being reported in terms of anecdotal rather than scientific evidence.

The Industrial Engineering School may recognize the existence of individual differences between workers, but they either ignore these differences or eliminate them by selection and training techniques. In spite of these techniques, there is considerable research evidence that individual differences in reaction to and attitudes toward repetitive specialized jobs intrude on the work place. There is some evidence that many workers like repetitive, simple, straight-forward tasks. Individual differences in reaction to boredom and repetition have been established by most investigators who have studied repetitive tasks and are reported in Chapter V of this report.

Moreover, in recent years, industrial engineers have recognized that they must take into consideration broader issues than motion economy (Buffa, 1960).

Davis and Taylor (1973) predict the demise of the industrial engineering approach with newly emerging technological and social changes. A more realistic evaluation may be that the industrial engineering approach should be assimilated to a greater degree in newer job design frameworks.

### Human Factors

Modern technology has changed the very nature of work. The trend in work has gone full cycle from manual labor to machine processing toward complete automation. This has involved a switch in the abilities and capabilities necessary to perform the job from the physical and manual to the mental level. We are becoming a work force of monitors. Many jobs have been created that require the worker to monitor automatic equipment and to react to the malfunctioning of systems. The work of Human Factors personnel has grown and emerged from military and space technology to wide and growing applications in the private and industrial sector.

Peterson (1974) believes that human factors specialists must join in and become the leaders of the work quality movement rather than passive observers. Corlett (1973) points out three fundamental functions in human performance of information manipulation, energy transformation and ongoing goal directed behavior. Human factors must include a wider view of the effective use of human resources in addition to work on product and equipment design. One of the crucial problems for the Human Factors School is the design of

systems and equipment to maximize performance on monitoring and inspection tasks.

Corlett (1973) gives a number of illustrations of the value of the engineering psychology approach to the design of man-machine systems. He points out the fallacy that is widely accepted that physical work load is no longer a problem in the modern day factory. Studies are reviewed of lathe operators and spot welders showing that simple design changes resulted in more operator comfort and utilization of the machine. Corlett calls for the unified look at the human being in the total context of the industrial situation. Both Balchin (1947) and Corlett have urged, as others have, that human motivation should be considered part of the human factors problem.

Rosenthal (1973) describes a program at Lockheed which is very similar to that described by Harris and Chaney (1969) for North American Rockwell. Workers are encouraged to help redesign both their working environment and methods on a group basis with a member of a human factors group acting as an advisor. An impressive number of changes were suggested for improving micro-welding of circuits. The concept of fully utilizing the equipment users in suggesting, designing, and evaluating the equipment and environment appears to be quite successful in terms of the criteria of worker satisfaction and comfort.

The human factors approach is always concerned with the physical and physiological capacities of individuals. There is no general principle for job design but rather a series of principles for each specific job to guide the design.

Jordan (1963) emphasized the importance of designing systems and allocating functions between man and machines so that they are complementary. It was his contention that the motivation for the individual to complement the machine must come from within the task itself. Jordan saw the challenge of human factor engineering to design the man-machine system so that the operator would want to use his flexibility and judgment. In many respects, this challenge to the field has still not been met.

# Activation Theory

Scott (1966) has related his activation theory to job design. This theory postulates that the amount and variety of stimulation serves to motivate the worker and enable him to maintain high levels of performance. The relationship between activation level and performance is again generally described as an inverted U shape function. At low activation levels, performance is handicapped by a lack of alertness, a decrease in sensory sensitivity, and a lack of muscle coordination. This is explained as being due to insufficient cortical stimulation from the lower or brain stem reticular formation. At intermediate levels of activation, performance is optimal, and at high levels, performance is again handicapped by hypertensiveness, loss of muscular control, and in the extreme, total disorganization of response.

Fiske and Maddi (1961) postulate a characteristic activation level which is an internalized norm independent of external demands. Negative affect or avoidance is experienced when activation differs markedly from the individual's characteristic level; positive affect is associated with shifts of activation toward the character-

istic level. Applying this theory to task behavior and job design, it can explain worker responses to repetitive tasks, intrinsic-extrinsic job factors, and job enrichment principles. As workers become familiar with the work surroundings and the responses required in a repetitive task, a decline in activation level is expected. If the activation level falls below the characteristic norm, the worker will attempt to increase the amount of stimulation. This may be accomplished by leaving the work station, fantasizing or daydreaming, or social interaction with fellow workers. Much of this activation or impact increasing behavior is extrinsic to the task itself and may be incompatible with effective task performance.

The individual can introduce intrinsic variation into the task itself if the task allows discretion for method and pacing. This can be accomplished by setting intermediate goals and allowing changes of activity (rest pauses). The task must provide feedback to set these goals.

Job enrichment requiring the individual to attend to stimulation of greater variety and complexity is based on the activation theory, which asserts that as more variation is introduced into a repetitive task, the result is a reduction in habituation and activation closer to that required for optimal behavioral efficiency.

A related problem is task performance on a long-range basis comparable to the real world of work. Fiske and Maddi (1961) state that an organism's level of activation varies directly over time with the total impact of current stimulation. A great deal of investigation has been conducted in the area of performance decrement over time on vigilance tasks. A related problem is the maintenance of

output over a period of time in a factory assembly job or other industrial jobs. There has been less systematic experimental investigation of this problem. Decrement in vigilance performance is not a linear function of time but rather levels off at some point in time. This decrement has been shown to be a function of the difficulty of signal detection, characteristics of the stimulus signal, rest periods, and individual characteristics.

Murrell (1967, 1969) has conducted controlled laboratory studies of repetitive work and has concluded that an activation theory of performance on repetitive tasks explains the data more parsimoniously than other statistical or behavioral theories. He expands on the concept of auto- or self-arousal to explain psychological fatigue on a continuous task. The theory is that continuous tasks are basically low in arousal level, and the individual engages in auto-arousal. Murrell (1967) defines auto-arousal as "cortical activation resulting from stimulation of the reticular formation by the cortex; this stimulation being under voluntary control" (p. 430). To maintain homeostasis as auto-arousal increases, there are damping down corticofugal projections in the reticular formation which cause fatigue or decrement in performance.

Other investigators have attempted to relate performance and decrement to other physiological functions such as blood sugar level (Murrell, 1971; Sjöberg, 1968).

From a behavioral point of view, many investigators believe that activation level is a function of temperament and personality. Although generally, personality variables have not been shown to be related to job attitudes (Pallone, Hurley, & Rickard, 1971); they

have been shown to be related to a number of job variables: tenure, monotony, and reaction to work changes. One personality variable, extraversion, has been related to a number of work behaviors and outcomes. Extraverted individuals tend to have shorter tenure with a company and engage in more non-permitted work absences (Cooper & Payne, 1967). Barrett, Bass, O'Connor, Alexander, Forbes, and Cascio (1975) found that extraversion was correlated -.42 with intended future Naval service in a field study of Naval personnel. Eysenck's inhibition theory (1955) states that extraverted individuals are less capable of tolerating routine tasks because of differences in central nervous system activation which inhibits sustained task performance.

Three theories have been advanced to explain the work behavior of extraverts (Cooper & Payne, 1967).

First it is postulated that there is an inhibition effect in that extraverts are less capable of tolerating routine tasks. The second hypothesis concerns the finding that extraverts condition slower and that in the early socialization process they are less influenced by rules of behavior. They, therefore, engage in more non-permitted absences from work and leave work situations rather than showing work conformity and tenure. The third hypothesis infers that extraverts require more environmental stimulation because of their low arousal level and high arousal threshold. Extraverts may need more work variety than that provided by a repetitive machine-paced task.

Additional research in this area has found that on an auditory vigilance task extraverts and normal subjects showed a tendency for

decremental performance over time as compared to introverts. was a non-significant trend for extraverts to perform better on the vigilance task in a social condition as compared to an isolation condition. The authors infer that since decrement in performance may be a function of extinction of attentive responses due to the infrequent nature of reward on the occurrence of a signal, then introverts must find other reinforcement in the vigilance task that helps them to maintain high levels of performance (Bakan, Belton, & Toth, 1963). Other research has shown that neurophysiological maturation and aging occur later in extraverted individuals (Shagass & Schwartz, 1965) and that extraverts built more variety into their responses in a monotonous task (Hill, 1975; Sales, 1971, 1972; Sales, Guydosh, & Iacono, 1974). Davies (1970), in his review of performance on inspection tasks, concluded that differences in temperament are the most important factors in explaining decrement in performance.

In summary, these variations of the activation theory approach to job design are appealing to many as it is based on physiological and psychological theory and allows for experimental control and precise measurement of variables.

# Intrinsic-Extrinsic Job Factors

Herzberg (1968) has formulated a popular two-factor theory of work motivation with some relevance to job design. Herzberg states that satisfaction and dissatisfaction are separate entities that do not exist on a continuum. Job context variables (pay, company policy, supervision, working conditions) lead to dissatisfaction and are hygiene factors. Improving hygiene factors will eliminate dis-

satisfaction but will not motivate workers. Job content variables (achievement, recognition, work itself, and responsibility) are related to satisfaction and are motivators. Herzberg's principles of verticle job loading are based on job changes in content factors to increase a worker's feelings of achievement, recognition, and growth.

Herzberg distinguished between horizontal and vertical job loading and between job enrichment and job enlargement. Herzberg enumerated seven principles of vertical job loading to increase the motivational properties of jobs. These included: (1) removing some controls while retaining accountability, (2) increasing the accountability of individuals for their own work, (3) giving a person a complete natural unit of work, (4) granting additional authority to an employee-job freedom, (5) making periodic reports directly available to the worker rather than to the supervisor, (6) introducing new and more difficult tasks not previously handled, and (7) assigning individuals specific, specialized tasks. Horizontal job loading consists of adding more tasks to a short-cycle repetitive job. Similar elements are added to a job without altering the job content. Horizontal job loading is equated with job enlargement, and Herzberg stated that this older term should be avoided. Job enrichment involves vertical job loading principles and increases the motivational properties of tasks.

Herzberg's two-factor theory has received limited support in surveys of industrial workers. In a report of job satisfaction studies of 1968-1969, Pallone, Hurley, and Rickard (1971) reported that insufficient evidence is available to support the two-factor theory. A number of other investigators have concluded that satisfaction and dissatisfaction can reside in job content, job context factors, or both.

The intrinsic-extrinsic approach served as the conceptual framework for the early job redesign projects in the 1960's. Many job design practitioners believe that the simplicity of the two-factor theory led many job design projects astray as the theory failed to realize the importance of other relevant variables and put too much emphasis on intrinsic rewards and too little emphasis on the individual worker and his behavior.

# Sociological Approach

The work of Turner and Lawrence (1965) and Blood and Hulin (1967) focused attention on the role of group differences in response to job content and job design. Turner and Lawrence (1965), in a study of 470 workers from 11 industries and working on 47 different jobs, found that workers from small town settings responded favorably to desirable job attributes. Workers from urban areas responded with low job satisfaction to these desirable job attributes and with high job satisfaction to repetitive jobs. Turner and Lawrence inferred from their data that workers from large cities came from diverse heterogeneous social cultures and had failed to develop strong group or cultural norms. These norms included white-collar oriented values attached to enlarged, more autonomous, and skilled jobs.

Blood and Hulin (1967) tested the hypothesis that workers from larger cities were alienated from the work norms of the

middle class. These work norms include occupational achievement and striving, a belief in the intrinsic value of hard work, and general adherence to the ideas of the Protestant Ethic. Blood and Hulin, in reanalyzing data on 1300 blue-collar workers employed in 21 plants throughout the Eastern United States, found a correlation of -.50 between job level and work satisfaction in the most alienated communities; while in integrated communities, the correlation between these two variables was +.40.

Hulin and Blood (1968) reviewed the traditional theory of the effect of specialized jobs on performance. Specifically, the traditional model postulates a chain-type reaction of a stimulus condition of simplified low skilled jobs which results in perceptions of monotony, which in turn result in an affective response of boredom and job dissatisfaction and a behavioral response of absenteeism, turnover, and restriction of output.

Job enrichment basically consists of changing the stimulus condition from a simplified low skilled job to an enriched one. Hulin and Blood believe that the case for job enrichment has been drastically overstated. They believe that the values of the workers should be congruent with the actual task being performed. If a worker has middle-class values, and therefore desires the challenge and achievement to be provided by a task, then an enlarged or enriched job will provide positive motivation and desirable personal and organizational outcomes. Conversely, if the worker is alienated from the middle-class norms, and he is presented with an enlarged or enriched job, there actually may be a negative reaction in terms of motivation.

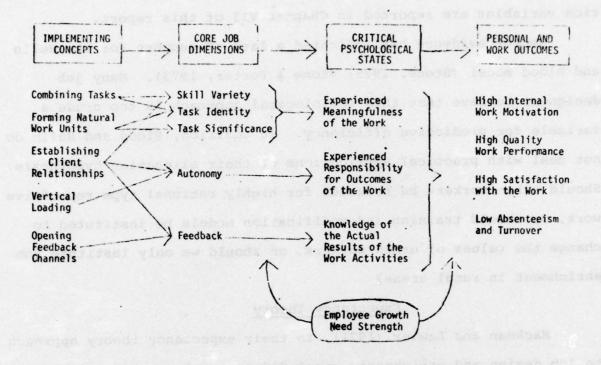
Other research studies involving the urban-rural and alienation variables are reported in Chapter VII of this report.

Recent evidence has indicated a lack of support for the Hulin and Blood model (Stone, 1975; Stone & Porter, 1973). Many job designers believe that this sociological approach is too crude a variable for predictive efficiency. In addition, Blood and Hulin do not deal with practical applications of their alienation hypothesis. Should urban workers be selected for highly rational type repetitive work, or should training and modification models be instituted to change the values of urban workers, or should we only institute job enrichment in rural areas?

# Expectancy Theory

Hackman and Lawler (1971), in their expectancy theory approach to job design and enrichment, concluded that only workers with strong higher order needs would respond favorably to jobs which have been enriched on four core dimensions: variety, autonomy, task identity, and feedback. In a study of 207 telephone company employees who worked on 13 different jobs, it was found that when jobs were high on the four core dimensions, employees who desired higher order need satisfaction tended to have higher motivation, higher satisfaction, be absent less frequently, and be rated by their supervisors as doing high quality work. These relationships were not found for workers with lower level need structure.

The higher order need strength approach has been integrated with job enrichment concepts by the recent work of Hackman, Oldham, Janson, and Purdy (1975). Their basic theoretical conceptualization has been graphically diagrammed by them and is reproduced below.



This theory rests upon the belief that there are certain core job dimensions. The core job dimensions of skill variety, task identity, and task significance are believed to relate to a critical psychological state; in this case, experienced meaningfulness of the work. The core job dimension of autonomy is believed to lead to the psychological state of experienced responsibility for the outcomes of the work. The core job dimension of feedback is postulated to lead to knowledge of the actual results of the work activities. These critical psychological states then lead to the personal and work outcomes of high internal work motivation, high quality work performance, high satisfaction with work, and low absenteeism and turnover. The complete model is moderated by the employee's growth need strength. Based upon these core

dimensions, a score can be computed which indicates the overall "motivating potential" of the job in question. This is measured by the <u>Job Diagnostic Survey</u>. It is further postulated that those individuals who value both feelings of accomplishment and growth will respond most favorably to a job high on the motivating potential score scale, while individuals who do not desire these growth needs may not respond in a positive fashion to these sorts of jobs.

In addition to measurement problems, the construct of higher order need strength implies an internalized state of the individual that may be somewhat more removed from behavioral overt tendencies than other attributes.

In the last two years, job enrichment projects that have failed have finally been reported in the research literature.

The failures are explained on the basis of problems in implementing job enrichment rather than weaknesses in the theoretical assumptions underlying the higher order need strength conceptualization.

### Congruence Approaches

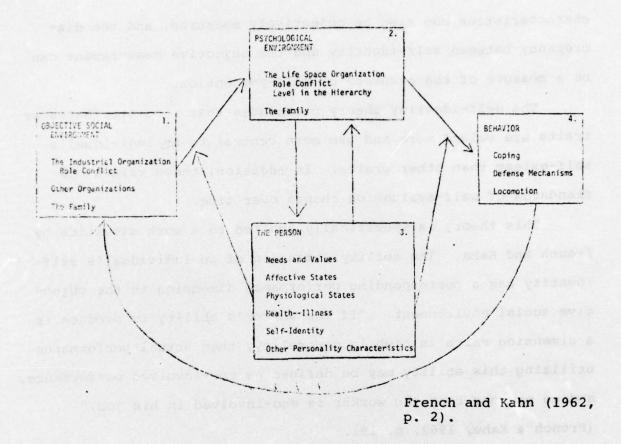
There is a growing body of research literature pointing to congruence models for job design. These models are concerned with the match or fit between a number of variables: (1) individual attributes (ability, personality, age); (2) perception of the task; (3) organizational climate, structure, and technology; and (4) external environment, the world at large. These approaches infer that work outcomes like performance, satisfaction, turnover, and physical and mental health are a function of the match or "mismatch" between these variables.

Betz, Weiss, Dawis, England, and Lofquist (1968) formulated an early theory of work adjustment based on the correspondence between the individual, which includes his abilities and needs, and the work environment, which includes ability requirements of the job and the reinforcer system. The theory is based on nine propositions, and the investigators conclude that the correspondence between the individual and the work environment increases with increasing job tenure. This theory is based on earlier investigations concerning the relationship of ability to job performance and satisfaction (Lofquist & Dawis, 1969; Dawis, Weiss, Lofquist, & Betz, 1967).

Additional research on the effects of the ability level of the worker include Barrett, Bass, O'Connor, Alexander, Forbes, and Cascio (1975), Betz (1971), Bills (1923), Cummings and Schwab (1970), French (1973), Gadel and Kriedt (1952), Lipsett and Wilson (1954), Lofquist and Dawis (1975), O'Reilly (1973), Schmidt (1975), Schuh (1967), and Wasson (1971).

French and Kahn (1962) present a broader congruence type theory regarding the effect of the organizational environment on an individual's behavior and level of functioning. Their focus is on presenting an integrated theory of personality and organizations which considers the total person-environment field. The theory builds heavily on the work of Lewin.

The figure below details the major variables and the arrows indicate the major hypotheses of the model.



They distinguish between the psychological environment and the objective social environment. The psychological environment and the person include all factors within an individual's life space that affect behavior. The objective social environment includes the industrial organization and the family. The vague mental health criterion of contact with reality becomes the degree of correspondence between the psychological environment of the individual and the social environment.

A self-identity theory of personality is used in the model and includes a person's values, social needs, motives, interests, abilities, physical characteristics, and traits as they exist from the individual's point of view. These abilities, traits, and

characteristics can also be objectively measured, and the discrepancy between self-identity and the objective measurement can be a measure of the accuracy of self-perception.

The self-identity theory postulates that some attributes or traits are valued more and are more central to an individual's self-esteem than other traits. In addition, these values and standards of self-evaluation change over time.

This theory is specifically applied to a work situation by French and Kahn. The ability dimension of an individual's self-identity has a corresponding performance dimension in the objective social environment. "If the worker's ability to produce is a dimension which is high in centrality, then actual performance utilizing this ability may be defined as ego-involved performance, and we may say that the worker is ego-involved in his job," (French & Kahn, 1962, p. 19).

Under this situation, job performance affects self-esteem. However, if a worker performs only for an instrumental goal, like money, his performance will not affect his self-identity.

Self-identity theory is linked to self-actualization motivation by focusing on the degree to which an individual is using his valued skills and abilities. The theory states that an increase in utilization will produce an increase in self-esteem. A decrease in the use of one's skills and abilities may result in these attributes becoming less central and important to one's self-identity.

The theory views organizations as open dynamic systems characterized by a series of inputs, transformation, and outputs. The relationship between the organization and the behavior of the individual is indirect through the psychological environment.

The parts of an organization which affect the person or get into his psychological environment are called "life space organizations." This means that each individual has a different life space organization of the objective organization, and these different views do not coincide. Second, every individual perceives the organization, and these percepts may or may not be congruent with the reality of the objective organization. Third, the success of a person in relating to other people in the organization depends on the congruence of their perceptions with the other person's perception.

Another aspect of the theory involves the role an individual occupies in the organization. An individual may derive intrinsic satisfaction from his role performance and may come to identify with the organization.

French and Kahn then proceed to define mental health in terms of this theory. The definitions are based on the person-environment fit. The criteria include the following: (1) accuracy of self-concept (congruence, self-perception, and objective reality), (2) growth, development, and self-actualization (utilization and development of abilities and skills), (3) integration (relationship of roles and compatability of abilities, traits, and characteristics), (4) autonomy (extent to which behavior is determined by internal forces or motives and external forces), (5) perception of reality (fit between objective environment and psychological environment), (6) interpersonal competence, (7) objective states, (8) physiologic states, (9) disease entities, (10) specific criteria of job performance (productivity, quality, rate of promotion, goodness of fit between the person and the job), and (11) adjustment

(goodness of fit between requirements of person and support available to him in the environment).

In a more recent conceptualization, Lorsch and Morse (1974) postulate a contingency theory model of job design which includes the external environment, the internal environment, and numerous personality dimensions. They found that when all three sets of variables were congruent with each other, this resulted in the units being successful performers and the individual's feeling of a high sense of accomplishment. This was true for organizations with widely different external environments; namely, research and development units and manufacturing units.

The personality dimensions measured were integrative complexity, tolerance for ambiguity, attitude toward authority, and attitude toward individualism. In these personality dimensions, the research and development members and the manufacturing members did not significantly differ from each other. The internal environment was found to be particularly important in differentiating between the most and least successful unit's performance. When there was an incongruence between the personality dimensions and the internal environment, the unit was less successful in both types of external environment. In essence, a three-way match was required in order to successfully describe a successful or unsuccessful unit.

While the data presented by Lorsch and Morse do not explicitly speak to the question of causality, there is at least some support given for the proposition that the fit is the important determinant of work performance and the feeling of competence by the organizational members. If that proposition is true, then organizational

design, according to the contingency theory, would appear to be an appropriate approach for an organization wishing to maximize its resources.

The organizational design, of course, has a great deal of bearing upon the design or redesign of jobs. For example, the span of supervisory control may be reflected in the workers' feelings of responsibility.

Much of the classic job redesign solutions start from the bottom and work their way up, having implications for supervisors. In effect, Lorsch and Morse advocate working from the top down where the design of the organization will eventually have some effects upon each succeeding level so that allowing a clerk to have more freedom in answering letters from customers without supervisory checking may be functionally the same as increasing the span of control of supervision in the total organizational design. This work builds heavily on the earlier work on organizational structure and design by Dalton, Lawrence, and Lorsch (1970), Lawrence and Lorsch (1967a, 1967b), and Lorsch and Lawrence (1972). Recent work in this area includes Morse (1973, 1975).

Based on congruence models, a variety of computerized assessment and classification techniques are being developed to match people to positions. This work involves differentiation of people, identification of job families or requirements, and a matching process (Charnes, Cooper, Niehaus, & Stedry, 1969; Schoenfeldt, 1974).

Another approach to job design rests on empirical data that indicates that the understanding and prediction of job design out-

comes is dependent upon the congruence among preferred and described job structural attributes, ability levels, and the physical characteristics of the task (Barrett & Dambrot, 1975b). This model is based on a number of conclusions regarding the current state of the job design field. First, there does not seem to be a set of job core attributes common to all jobs. But the attributes which are important for any job are often somewhat unique to it.

Second, it is important to measure both individual job structural preferences and the described attributes of the job. This allows you to develop a discrepancy score between what job structural attributes an individual prefers and what attributes he actually perceives the position to have while he performs the task.

Third, individual abilities have been found to be the single most important factor in a number of studies in determining not only performance, but the satisfaction of the individual performing the task.

Fourth, the research literature indicates that the individual's ability level will often determine some job structural attribute preferences, while value orientations will relate to other job structural preferences. This is in contrast to the other approaches to job design which would indicate that growth need strength is the most important variable in determining individual task structural preferences.

Fifth, expectancies concerning the job can influence subsequent perception of job structural attributes and the relationship between ability and performance. Congruence approaches to job design have recently been challenged by a study by Baker and Hansen (1975) which is reported in detail in Chapter V of this report. Their results did not support congruence models that postulate that the greater the congruence between a worker's orientation and the job structure, the greater the degree of satisfaction.

Morse (1975) has developed a person-job congruence based upon five personality characteristics, which include tolerance for ambiguity, attitude toward authority, attitude toward individualism, cognitive complexity, and preferred arousal level. The concept of job certainty described the environment to which there is a congruence with the five personality types. This study was unique in that 39 individuals were actually placed into certain jobs and 34 into uncertain clerical jobs. For eight months on these jobs where there was a congruence between individual personality and the job, there was an increased sense of competence over that of a control group. The conclusion was reached that individuals working on very predictable, routine jobs can perceive themselves to be as competent and as experienced as people working on more complex jobs. There was a fairly high degree of congruence between the individuals' ratings of their jobs and those of their supervisors. In the control group, though, there was a discrepancy between the participants' and the supervisors' ratings of the job certainty.

This study reinforces the idea that job design is a more complex process which does require a job/person fit or congruence. There was no support for the normative ideas that all individuals

should perceive jobs as being routine or complex. This result tends to be congruent with the findings of Barrett and Dambrot (1975) and deviates from the conceptualization of theorists such as Herzberg.

# Organizational Development and Job Design

This approach to job design stresses the uniqueness of each organization. Organizational development consists of the application of a variety of methods and concepts to improve the quality of the work environment and profits as well. Huse and Beer (1971) concluded that there are no simple standard procedures that can be applied to all organizations. The problems of each organization should be diagnosed by management with the help of outside consultants. Then organizational development is based on four beliefs:

- The operating manager is very concerned about doing a good job and works hard at it. He is far more concerned about results than about theory as such.
- 2. If a spirit of inquiry and experimentation can be developed in an organization, the operating manager will try new approaches and will continue to use those that help him get his job done better. Conversely, he will drop or cease using an approach which for him is not helpful, at least as he perceives it.
- 3. The role of behavioral scientists (or change agents) should be to help the operating manager do his job better (by acting as resource people) but not to tell him how to do his job.
- 4. A variety of approaches to improvement have their place in an organizational development program, and neither the manager nor the change agent should become wedded to any single tool or technique. (For example, although sensitivity training has been widely used in industry as an instrument for change, it has not been used at this plant and indeed may never be used unless it appears appropriate at a particular point in time). (p. 105).

In describing an organizational development project in one plant, three interventions were used. These included job enrichment, autonomous or integrated work teams, and the principles of the integrator. Integrators are used to bring together work groups and sections with differing goals and objectives, such as plant engineering and marketing. Huse and Beer (1971) concluded that the project increased the effectiveness of the organization and that operating managers continued to use those techniques that worked, that no single technique was effective by itself, and that employees desired responsibility, challenging work, and an opportunity to grow.

Sorcher (1969) and Sorcher and Meyer (1968) adopt a similar systems approach to job design. Walton (1972a, 1972b) argues that work reform will require a systematic long-range approach. He states:

We must coordinate the redesign of the ways tasks are packaged into jobs, the way workers are required to relate to each other, the way performance is measured and rewards are made available, the way positions of authority and status symbols are structured, and the way career paths are conceived. (Walton, 1972a, page 74.)

Walton was able to implement innovations in all these areas in a new, large pet food manufacturing plant. Results indicated that after 18 months, the new plant's fixed overhead was 33% lower than in the old plant. Reduction in manufacturing costs, fewer quality rejects, and decreased employee absenteeism was reported to have resulted in annual savings of \$600,000.

Odiorne (1975) points out the congruence between job enrichment and management by objectives. Management by objectives involves dividing goals into three distinct categories of regular objectives,

problem solving objectives, and innovative objectives. Odiorne relates Herzberg's eight ingredients of a well designed job to management by objectives. These eight ingredients are: (1) direct feedback, (2) a client relationship, (3) opportunity for new learning, (4) responsibility, (5) unique expertise, (6) control over resources, (7) direct communication responsibility, and (8) personal accountability. Odiorne also describes conditions required for the successful application of management by objectives. He adds that in addition to defining objectives, management by objectives consists of decentralizing organizations, redesigning reward systems, and removing obstacles and constraints so that management can become supportive.

In evaluating past organizational development and management by objectives programs, interventions can be haphazard and the results reported on an anecdotal level rather than on an empirical level.

In addition, the operations manager may have too much at stake to report negative results.

Walton's design of a new plant has been severely criticized by members of the union movement as a stacked experiment carefully controlled and rigged to produce the desired results (Gomberg, 1973).

## Socio-Technical Systems

In America, the work of L. E. Davis on job design has focused upon the whole spectrum of the consequences of job design for the organization and for the worker. Davis divides the job design process into three activities: (1) the content of individual tasks, (2) the methods of performing each task, and (3) the combination of tasks into specific jobs (Davis & Canter, 1955). Job design is viewed as

the organization of the job to satisfy both technical and organizational objectives and the human requirements of the worker. Davis points out four approaches to job design which include a processcentered approach which concentrates on job specialization, a worker-centered approach in which the workers participate in the design of jobs and in the establishment of work teams and groups in a job enlargement framework, a combination of process-centered and worker-centered job design which may involve job rotation, and finally, a new job-centered approach in which job content is organized to satisfy the needs of the behavioral process of the organization and of the individual worker.

The criteria of job design changes should include not only direct costs of production but total economic productivity, including long-range costs of labor, turnover, absenteeism, quality, contract problems, and other costs (Davis & Canter, 1955).

In a more recent conceptualization, Davis (1971) considers job design and job satisfaction in the Post-Industrial Era. According to Davis, technology has advanced to the point that there will be continued substitution of mechanical and other forms of energy for human energy in the performance of work. In addition, computers have taken over tasks that can be programmed. Future work will involve highly adaptive responses of workers to complex situations and a rapidly changing environment. Successful job design in the post-industrial era will require finding ways to achieve a compromise between the organizational, technological, and human requirements so that each is maximized. Davis placed prime importance on responsible, autonomous job behavior. Responsibility to Davis implies that

workers accept accountability for product completion, work rate, quantity and quality of output, and the interdependence of workers in the work cycle. Autonomous behavior involves self-regulation of work content, structure and methods within the assigned job, self-evaluation of performance, and participation in setting job goals and objectives.

The English Tavistock Institute Group has had a tremendous impact in recent years on organizational theory and job design.

Cooper and Foster (1971) review the socio-technical system theory developed by the Institute. Other general articles on the socio-technical systems approach include Herbst (1974); Hickson, Pugh, and Pheysey (1968); Hrebiniak (1974); Inkson, Hickson, and Pugh (1968); Mahoney and Frost (1974); Miller and Rice (1967); Mohr (1971); Pheysey, Payne, and Pugh (1970); Pugh (1966); and Pugh, Hickson, Hinings, and Turner (1969).

The work of the Tavistock group, in the study of the changeover from the shortwall conventional method of coal mining to the
mechanized longwall method, led to the formation of the sociotechnical systems approach to organizational theory (Trist & Bamforth,
1951; Trist, Higgin, Murray & Pollock, 1963). This systems approach
views the technology and social system of an organization as mutually
interdependent and interactive systems. The Tavistock group
postulate three different organizations operating in an open dynamic
changing structure: (1) activity or task, complex of activities
necessary to transform an intake or input into an output or to perform
the task or service; (2) sentient group, group to which individual
members commit themselves and are dependent upon for emotional

support; and (3) administrative, which involves regulations of relations between task and sentient systems.

In addition, this group postulates the concept of the open system which is derived from cybernetics. Systems are regarded as having inputs such as raw materials, people, or information on which the group operates or converts into outputs of products or services, or both. The Tavistock group, by adding the concepts of sociotechnical systems to the open system model, increased in import the interaction between the organization and the environment in two ways. The environment controls inputs (raw materials, labor, capital, etc.) and outputs (state of economy, government regulations, and consumer preferences).

Additional constraints are imposed on the organization by the expectations, values, and norms of the human elements composing the organization. These human elements are not only individualistic and personalistic, but are influenced by the experiences and transactions of the individual with the organization and have been broadly included under the vague terminology of organizational climate.

The English Tavistock Institute and job design projects in Europe have emphasized the formation of semi-autonomous work groups, worker participation in job design and planning, and a movement toward industrial democracy. The Institute has shown that these autonomous work groups are compatible with modern technology. These teams are leaderless and require coordination and cooperation between team members. Members of the team have multiple skills and make job rotation assignments among themselves.

A conclusion regarding greater worker participation is that it enables an individual to exercise more control over his job and his life at work. This increased control leads to a higher level of commitment to the organization (Davis & Taylor, 1973).

From the work of the Tavistock Institute in England and Davis in America, the following principles for job design have been derived:

- (1) optimal variety of tasks within the job.
- (2) a meaningful pattern of tasks that gives to each job the semblance of a single overall task.
- (3) optimum length of work cycle.
- (4) some scope for setting standards of quantity and quality of production and suitable feedback of knowledge of results.
- (5) the inclusion in the job of the auxiliary and preparatory tasks.
- (6) the tasks included in the job should entail some degree of care, skill knowledge, or effort that is worthy of respect in the community.
- (7) the job should make some perceivable contribution to the utility of the product for the consumer.
- (8) provisions for interlocking tasks, job rotation, or physical proximity where there is a necessary interdependence of jobs, or where there is stress, or where the individual jobs do not make a perceivable contribution to the end product.
- (9) groups of workers on interlocking jobs should set standards as a group and receive knowledge of results and have some control over boundary tasks.
- (10) provisions of channels of communication so that the minimum requirements of the workers can be fed into the design of new jobs at an early stage.
- (11) provision of channels of promotion to foreman rank which are sanctioned by the workers. (Davis & Taylor, 1973, pp. 455-457.)

Each of these conceptual frameworks continue to contribute to the job design field. The basic question is whether this spirit of eclecticism is productive or dysfunctional. Some have argued that the field needs a stronger unified conceptual framework. Others have insisted that since the problems of job design are unique to each organization, specific techniques are required rather than general laws to be broken. These various approaches to job design provide the framework for this report and will be referred to in succeeding chapters.

### Summary Statements

- (1) The field of job design is characterized by youth, diversity, and the lack of a clear or comprehensive theoretical basis.
- (2) Scientific management and industrial engineering approaches to job design rest on the assumption that productivity is maximized by designing jobs for individuals with minimal ability and motivation negating the role of individual differences.
- (3) The surface simplicity of the two-factor theory has lead researchers and practitioners to follow courses of actions that negate the role of individual variables and the complexity and range of human motivation.
- (4) The role of group and cultural variables include the effects of urban-rural differences, alienation, and Protestant Work Ethic on work behavior. It is difficult to incorporate these group variables into job design decisions which include broadly based quality of work life criteria. The practical applications are difficult. Should job redesign interventions include only rural workers with middle-class work values?

- (5) Motivational theories of work behavior (higher order need strength, expectancy, and intrinsic motivation) have provided a theoretical framework for job design. There have been problems in operationally defining and measuring these vague motivational constructs. In addition, basic theoretical assumptions and propositions have failed to be empirically supported or validated.
- (6) The congruence approach to job design rests on the assumptions that ability and cognitive variables are as critical to job performance as motivational states and that workers' preferences for job attributes, expectations, work values, and orientation interact with the task and the organization.
- (7) Organizational development emphasizes the uniqueness of task organization and an idiographic consultant approach to job design. Global or general theories are viewed as inadequate and inappropriate.
- (8) Socio-technical systems approach to job design focuses on three elements: (1) the requirements of the organization (task),(2) the characteristics of the people on the organization (sentient),and (3) the relationships between task and sentient systems.
- (9) The basic unanswered question is whether this spirit of eclecticism is productive or dysfunctional for the job design field.

### CHAPTER III

#### MEASUREMENT OF JOB STRUCTURAL ATTRIBUTES AND TASKS

# Conceptual Approaches to Task Description

Virtually every researcher attempts to measure those aspects of a job or task which are relevant. There are almost as many diverse measurements as there are researchers in the field. Job design critics report that the field is glutted with ill-defined terms and concepts (Cooper, 1973). For example, job enlargement, job enrichment, job rotation, work restructuring, and vertical and horizontal job loading are used interchangeably, and frequently, incorrectly. Job structural attributes change in meaning from study to study. Worker participation can range from token meetings with management to truly autonomous work groups. Task variety can be operationally defined in terms of a number of variables -- cycle time, number of operations performed. Boredom can be defined in terms of time drag, drop in production curves, physical correlates of brain wave patterns, or eye movements. For several years, a number of investigators have emphasized an urgent need for improvement in models and methods of task classification, description, and measurement.

Hackman (1969a, 1969b) and Fleishman (1975) describe four previous conceptual approaches used in the description of tasks. The first is a behavioral description approach. This approach focuses upon the overt response actually emitted by the individual performing the task. Prien and Ronan (1971), in their review article on job analysis, report that descriptions can range from the minute task analysis approach used by industrial engineers to the global narrative descriptions used in wage and salary administration. Behavioral

descriptions are dependent upon the method which is used to obtain the information. These methods can include observation, interview job activity inventories, and statistical analyses of data includi cluster analyses or factor analyses. Results of this approach are also dependent on the source of information in terms of incumbent, supervisor, or expert observer.

A second method of describing tasks concentrates on the behavioral requirements of a task. What is required of the worker tachieve a standard or acceptable level of performance on a task? The behavioral requirement approach consists of the skills and tranecessary to perform the task. It is assumed that communality in required skills implies generalization across different tasks.

The third method of describing tasks is the ability requirements approach. Tasks are described in terms of the basic abilition that a task requires of the worker. Fleishman (1975) reports that the abilities approach differs from the requirements approach in terms of the level of description. Abilities are more enduring the of the individual and are derived empirically through factor analy studies, while behavioral requirements are derived rationally and are more dependent on training than ability factors. The assumption is that tasks which require the same abilities should be classified together.

The fourth approach has been labeled <u>task-qua task</u> by Hackma (1969b) and the task characteristic approach by Fleishman (1975). This approach focuses on the physical properties of the task as a stimulus which is presented to the individual performing the task.

These various approaches to task description have resulted in a somewhat confusing state of affairs. The job designer has more control over the task than other variables operating in the work environment. Precise definitions and measurement of tasks are essential to increase the job designer's predictive efficiency and the utility and generalization of results across tasks.

This review will consider task measurement and classification from a slightly different conceptual approach than that used by Hackman or Fleishman. We shall categorize attempts to define and measure tasks by the methodology employed. These methodologies include a rational approach to task taxonomy, workers' ratings and perceptions of a task, observation and rating scales used by experts, ability reference tests, and quantification of the physical properties of a task.

# Rational Task Taxonomy

Using this approach, investigators consider task similarities and differences and attempt to intuitively define categories for classification. The purpose of classification and taxonomic systems is to achieve economy and ease of information and to describe relationships among objects that will be heuristic in that the classification generates research hypotheses (Sokal, 1974). Recent conceptual developments in taxonomic science involve the acceptance of polythetic taxa in which groups are classified together if they share a large proportion of their properties but do not necessarily agree in any one property. These classification systems based on polythetic taxa usually recommend equal weighting of these properties (Sokal, 1974). The development of a taxonomic system for tasks is considered crucial

by many. Melton and Briggs (1960), in an early review of engineering psychology, pointed to the need of a taxonomy of tasks to allow integration of not only engineering psychology research but all aspects of human learning and performance.

Berliner, Angell, and Shearer (1964) have developed a rational hierarchical classification system of 50 specific work behaviors (e.g., detects, inspects, categorizes, adjusts, aligns). These specific work behaviors are subclassified into six activities and four higher major processes which are viewed as mutually exclusive subclasses. The four major processes are perceptual, mediational, communicative, and motor. The six activities represent categories of the major processes. The perceptual process is subdivided into two activities: (1) searching for and receiving information, and (2) identifying objects, actions, and events. The mediational process involves activities of information processing and problem solving or decision making. Communication is not subdivided into activities. Motor processes are subdivided into simple and discrete or complex and continuous activities. Berliner et al. (1964) have developed a matrix for classifying and measuring specific work behaviors. They recommend measurement of the specific work behaviors in terms of (1) times-start, completion, and duration, (2) errorsomission, magnitude, and direction of tracking deviation, (3) usefrequency data, (4) work load data--including idleness periods, (5) motion dynamics--postural orientation, skeletal movements, eye movements, and other force applications. Rabideau (1964) reviews the application of this taxonomic system for field evaluation of human performance.

Christensen and Mills (1967) classified activity data from paper-and-pencil tests according to Berliner, Angell, and Shearer's taxonomy. Two raters classified complex operators' jobs (navigator, pilot, controller). Interjudge reliability ranged from .29 to 1.00. The authors recommend the use of activity data obtained under operational conditions and increased standardization and operational definitions of the taxonomy. They concluded that after 20 years, we were not any closer to the development of independent criteria of human performance under operational conditions. Christensen and Mills recommend development of an operational taxonomy in terms of the use of standard, non-psychological terms which are validated in operational settings.

Miller (1967) has used the following rationally derived categories to classify general human task performance: concept of purpose (discriminating relevant from irrelevant cues), scanning function (active or passive searching for task cues), identification of relevant cue functions (differentiation of figure-ground and labeling or some other discriminatory action), interpretation of cues (meaning), short-term memory, long-term memory, decision making and problem solving, and effector response. Miller proposes a taxonomic grid of three categories consisting of psychological function, task content, and successive stages of learning the task.

Gagné (1963) described tasks in terms of identifying three general behavioral requirements including (1) the operationally distinct kinds of behavior the task requires, (2) the stimulus situation in which task performance takes place, and (3) the object which is acted upon by the performer. He classifies human functions

as sensory, identifying and interpreting, and human responses as unitary (pushing a switch), autonomous (operation of a familiar tool), or flexible (tracking a moving object).

Cooper (1972) presents a conceptual framework for studying the operator-technology interaction. He first classifies production according to five levels of technology which differ on the basis of the amount of human energy and intervention in the production These five levels of technology are: (1) mechanized manual production, (2) mechanized production, (3) integrated mechanized production, (4) automated production, and (5) integrated automated production. He then classifies the production process by the type of raw material used or the product produced. Fluid process production includes chemicals, petroleum, electric power, and food processing and is usually a continuous process. Solid process production is usually semi-continuous or batch and involves the manufacture of steel, rubber, plastics, and paper. Discrete part production is centered on the manufacture of units (i.e., automobile production). Cooper believes that the next step in technology lies in information processing and computer control of production.

Cooper's system is based on the work of Turner and Lawrence (1965).

The four intrinsic dimensions of tasks are (1) physical variety,
which is defined as the number of people available for interaction,
variety in physical location of work, and the degree to which continuous mental attention is required; (2) skill variety, which has
to do with task uncertainty and response uncertainty; (3) goal
structure, which is the clarity of goals and degree of goal attainment;

and (4) transformation, which is defined in terms of feedback or the perceived effects of operations on the stimulus material of the task.

The last component of this conceptual framework consists of group task dimensions. These include task dependence, which is the extent to which a task influences or depends on other tasks in the same work system; role differentiation, which refers to differences between tasks carried out by group members; goals which may be either mutual and common or independent; and finally, activities which may be carried out together or in isolation. Cooper uses this conceptual framework to examine changes in job content brought about by advanced technology.

Steiner (1972) concluded that tasks differ on the basis of divisibility among group members, criterion of success, and strength of task demand. His taxonomy of four types of tasks is as follows:

(1) disjunctive, a task in which some specific product is chosen to be the group's outcome; (2) conjunctive, a task in which the quality of the group's performance is determined by the work of the poorest performers; (3) additive, a task in which success depends upon the sum of all individual efforts, and (4) discretionary, a task that permits members to combine contributions in any manner desired.

Van de Ven and Delbecq (1974) developed a taxonomy of work units based on an analysis of task difficulty and task variability. Task difficulty refers to the degree of complexity of the search process in performing the task, the amount of thinking time required to solve work-related problems, and the body of knowledge that provides guidelines for performing the task. Van de Ven and Delbecq have modified a seven-item scale of task difficulty in which incumbents

respond to items along a 10-point interval scale. An example of an item is: "In some jobs things are fairly predictable. In others you are often not sure what the outcome will be. What percentage of the time are you generally sure what the results of your effort will be?"

Task variability is defined as the number of exceptional cases encountered in work requiring different work methods. An index of task variability consists of three items rated by incumbents on a 10-point scale and four true and false items. A sample question is, "How much variety in cases, claims, clients or things do you generally encounter in your working day?"

From this framework, the authors classify work units into three basic structural modes: (1) a systematized mode which includes paced, stable work methods, and procedures; (2) a service mode in which workers have discretion in performing their work, but unit members are independent; and (3) a group mode in which unit members are organized as teams and work is interdependent. Data on 120 work units within a large government employment security agency found empirical support for the taxonomy. The work units did differ in terms of task difficulty and variability using a fixed effects model.

# Workers' Ratings of Tasks

One way of measuring tasks involves ratings by workers. These ratings can be a function of a number of individual variables such as experience on the job, overall response set or satisfaction with work, purpose of the rating, and individual interpretation of questions, rating scales, and anchor points.

# Job Diagnostic Survey

A recent development in this area is the Job Diagnostic Survey (JDS) (Hackman & Oldham, 1974a, 1975). The JDS measures four separate areas and has been designed to be administered to employees who work on any job. These four areas are job dimensions, experienced psychological states, affective responses to the job and individual growth need strength. The job dimensions include measurement of the five core variables plus measurement on feedback from agents and dealing with others. The skill variety dimension has been defined as the degree to which a job requires a variety of different job activities in carrying out the task and also the use of a number of different skills of the incumbent. The task identity dimension measures the completion of a whole and identifiable piece of work. The task significance dimension was designed to measure the degree to which the task has a substantial influence or impact on the lives or work of other people. The autonomy dimension indicates the degree to which the task provides freedom and independence for the employee in both scheduling the work and determining the procedures. The feedback from the job itself dimension indicates to what extent the job provides clear information about the effectiveness of performance. The feedback from agents dimension indicates the degree to which the incumbent receives information about performance from supervisors or co-workers. The dealing with others dimension indicates how much the employee has to work with other people in order to accomplish his job.

The second area measured by the JDS consists of critical psychological states. The experienced meaningfulness of the work is a measure of how much the employee believes the job is meaningful

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and worthwhile. The experienced responsibility for work outcomes is a measure of the degree the incumbent feels personally responsible for the results of the work. The last critical psychological state, knowledge of results, is the degree to which the employee believes that he knows continually how effectively he is performing the job.

The third part of the survey, the affective reactions to the job, is designed to be a measure of the personal outcomes obtained from doing the task itself. These include a general satisfaction measure, an internal work motivation measure, and a number of specific satisfactions to be obtained from the job. The internal work motivation scale attempts to measure self-motivation and thereby determine if the employee experiences positive internal feelings when he believes he is working effectively on a job and negative feelings when he believes he is doing poorly.

The last area measures individual growth need strength. This measure was designed to tap individual differences in the incumbent's desire to obtain "growth" satisfaction from the work.

The JDS can also be used to derive a motivating potential score. This score reflects the potential of a job for eliciting positive work motivation from employees who desire growth need satisfaction. This score is based on the summated ratings of skill, variety, task identity, and task significance, divided by three and multiplied by autonomy and by feedback from the job.

Hackman and Oldham also developed the <u>Job Rating Form</u>, which allows the investigators to obtain measures of the core dimensions from individuals who are not themselves incumbents of the job, such as supervisors or outside observers. Since the items parallel those

on the JDS, three different measures of the core job dimensions are possible. This allows for a comparison between the ratings of different groups of employees, supervisors, and outside observers. The ratings of these individual groups were averaged, and then correlations were computed between the various job dimensions. The median correlation between the ratings of employees and supervisors was .51, between employees and observers .63, and between supervisors and observers .46. It should be noted that these correlations are inflated since they are based upon means of the respective groups. Using a different statistical technique, the relationships would be less. There is also a great deal of variability among the correlations for the various job dimensions. For example, feedback from agents varied from between .14 through -.13; task identity varied between .31 through .44; task significance varied between -.14 to .65 (Hackman & Oldham, 1975).

Additional problems in the Hackman and Oldham approach involve the measurement of outcome variables. They state that the measurement of internal work motivation is particularly critical to the theory. A typical questionnaire item designed to measure work motivation is "I feel a great sense of personal satisfaction when I do this job well." A basic question might be whether or not you are really measuring internal work motivation or an alternative measure of work satisfaction. For example, if an individual describes his job and the work he does in very positive tones, this would imply that he does get satisfaction from the work when it is done well. It is also difficult to believe that any individual who expresses very low job work satisfaction would also get a great deal of personal satisfaction from doing the job well. The main difficulty of this

approach is that you have quite an epitome of compounded measures with different labels attached to them.

An additional aspect of the problem is that there might be an overall response set to this type of questionnaire which will tend to yield positive relationships among all the variables.

Some may view their total job in a relatively favorable light, while others may view their total job and life experience in a negative set. This, of course, can give you a spuriously high relationship among so-called causal and outcome variables. McCormick (1974) has found a .37 relationship between response disposition and work satisfaction which tends to indicate an overall response set to these types of attitude surveys.

Another measurement problem involves perceived changes in job satisfaction and job factors. Hardin (1965) reports on the use of survey data to measure worker reactions to job changes. A survey in a medium size insurance company asked the workers to rate their overall job satisfaction on a five-point rating scale. In a sixmonth period, an electronic data processing system was installed. Six months after the first survey, the workers were asked to rate their general satisfaction and the degree to which their jobs had changed on 14 aspects. The sample consisted of 196 employees. The authors concluded that perceived change in job satisfaction was a poor predictor of actual change and that the quasi-longitudinal design may not be useful in studies of the effect of technological change on job satisfaction.

### Differential Perceptions

A number of other investigators have looked at differential perceptions of the same jobs by incumbents, supervisors, and long-

term employees. Dubin, Porter, Stone, and Champoux (1973) studied differential perception of 16 craft jobs in a telephone company. Job incumbents (N = 164), craft workers or peers (N = 189), and supervisors (N = 270) rated these 16 jobs on eight characteristics which included variety, autonomy, wholeness of job, feedback, friendship opportunities, dealing with others, prestige--craft jobs as reference, and prestige -- all other jobs as reference. The results indicated that supervisors and craft workers perceived the jobs similarly, but there was considerably less agreement between incumbents and craft workers and between incumbents and supervisors. Employees with low tenure and in relatively low-skilled jobs rated their own jobs higher than did supervisors or peers. The tendency to rate one's own job lower than others was associated with holding a skilled terminal job in the organization. On four of the eight job characteristics, there was a tendency for incumbents to rate their own jobs higher on dealing with others, autonomy, and variety and lower on wholeness of jobs than did their supervisors or peer craft workers. These findings did not apply to all 16 jobs.

Desmond and Weiss (1971) found that workers' ratings of the ability requirements of 11 jobs using the Minnesota Job Requirements Questionnaire (MJRQ) were similar to supervisors' ratings. The MJRQ includes ratings of nine abilities of the General Aptitude Battery. Another related study compared the ratings of 338 supervisors of 9 jobs and 381 workers on the Minnesota Job Description Questionnaire. This questionnaire uses the method of multiple rank orders for rating the relative strength of 21 occupational reinforcers (e.g., ability utilization, achievement, compensation, coworkers, variety, responsibility, etc.). Statements describing the

reinforcers are presented in groups of five with every reinforcer paired with every other reinforcer one time. The job title is specified and the rater is instructed to rank each group of reinforcers from 1 (least descriptive of the job) to 5 (most descriptive). The results indicated that, in general, supervisors and workers generally perceive reinforcer characteristics the same, although they do tend to disagree on extrinsic reinforcers. These included differences in ratings of supervisors, company policies and practices, compensation, recognition, and working conditions. In all cases, the supervisor rated these reinforcers as more characteristic of a particular job than did the worker. It was also found in lower level occupations that there was more disagreement on extrinsic reinforcers than in higher level occupations.

Siegel and Pfeiffer (1975) have used workers' ratings to establish the complexity of electronic circuits. Sixteen circuits were identified by multidimensional scaling analysis and factor analysis. These circuits were then judged by Naval aviation electronics maintenance personnel (N = 36) using four different scaling methods: rank order, paired comparison, magnitude estimation and constant sum. Two factors accounted for the scaling behavior. These were cognitive discrimination and contextual uncertainty. Paired-comparison and constant sum rating scales were heavily weighted on the cognitive discrimination factor. This factor was interpreted as reflecting a less difficult cognitive perceptual task. The other rating factor, contextual uncertainty, was most related to rank order and magnitude estimation scales and involves judging or rating a greater number of stimuli at one time. Additional studies by

Siegel and Pfeiffer have investigated the relationship of perceived circuit complexity to the difficulty of meeting five operational correlates of fleet maintenance performance (readiness, performance, operation, safety, preparation). In addition, they studied the effect of circuit complexity on the job training required before workers could perform tasks on their own. Linear relationships were found between perceived circuit complexity, and these operational correlates ranged from .33 to .66 for a sample of 20 avionic technicians.

#### Work Itself/Work Environment Questionnaire

Another measure of Job Structural Attributes is the Work

Itself/Work Environment Questionnaire (WI/WE) which was developed
to provide a comprehensive inventory of discriminably different job
elements (Cascio, 1973); that is, properties of the job itself,
including variety, learning new skills necessity, learning new skills
opportunity, follow through independence methods, independence pace,
goal clarity, and internal feedback, as well as properties of the
environment surrounding the performance of the work, including
salary, interpersonal relationships, external feedback, job-person
fit, job security, work scheduling, company policy, status inside
company, status outside company, and service to others. The overall
aim of the WI/WE is to present a set of elements that reflect both
the intrinsic and extrinsic motivational properties of the job.

A literature review and synthesis of existing theory and data served as a starting point in the development of the WI/WE. Items were written to cover the full range of scale values for each of the elements, and then both items and elements were reallocated and

scaled by a pool of 150 judges according to the Smith and Kendall (1963) procedure.

In its present form, the WI/WE provides three measures. The first is a measure of the level of each attribute that the individual perceives in the task. The second is a measure of that same individual's preference level for that attribute. The third, of course, is the degree of match between perception and preference (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975). Attribute Preference Scale/Attribute Description Scale

A second technique designed to measure the same three sets of variables is the Attribute Preference Scale/Attribute Description Scale (APS/ADS) (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975). The job attributes were selected on the basis of a summarization of past literature and included variety, independence responsibility, job complexity, closure, and learning new skills. The items selected to represent each of these attributes were chose from a pool developed through the use of a retranslation procedure. The items selected were then built into paragraph-long job descriptions of potential tasks. The amount of each attribute represented in the job descriptions was varied by injecting scaled expressions of frequency, the values of which had been previously determined. Using high and low expressions in each item, two sets of descriptions were developed. Alternate forms of each set of descriptions were also developed with a reliability of .81.

This resulted in 16 job descriptions which contain a statement regarding the presence or absence of each of four job attributes.

The individual respondent sorts these 16 statements using a Q sort

technique into a rank order of the extent to which each statement is descriptive of his present job, then at a later time, sorts the same set into a rank order of preferred attributes.

Summations of the four attribute scores are then computed to provide indices of overall preference for Job Structural Attributes and amount of those attributes present in the individual's job.

The discrepancy between preferred and described attributes can also be quantified from this scale.

#### Measures of Job Preferences, Values and Attitudes

The Job Activity Preference Questionnaire (JAPQ) is a measure of the strength of a worker's interest in having certain types of activities as a part of his job. The format of the JAPQ parallels the Position Analysis Questionnaire (PAQ) developed by McCormick and others. The PAQ is a structured job analysis instrument. The basic form of the JAPQ includes 150 of the 187 items in the PAQ and is divided into the same six work activities (information input, mental processes, work output, relationships with others, job context, and other job characteristics. A modified copy of the JAPQ is included in Calitz, Hilaael, McCormick, and Peters (1974), and the original JAPQ is in Mecham, Harris, McCormick, and Jeanneret (1972).

Typical items are:

Following is a list of job requirements. Use the number 0 to 5 to rate how much you would want each to be a part of your work....

[Item 128] Precision (need to be more than normally precise and accurate).

[Item 129] Attention to detail. (Mecham, Harris, McCormick, & Jeanneret, 1972, page 8.)

The Work Components Study (WCS) developed by Borgatta (1967), Borgatta, Ford, and Bohrnstedt (1968), and Ford, Borgatta, and Bohrnstedt (1969) is a measure based on Herzberg's two factor theory of motivation. The scale consists of 64 items which describe jobs (e.g., the work might be excessive sometimes). The respondent ranks the item on desirability by using a five-point scale ranging from completely undesirable to extremely desirable.

The revised version of the WCS contains seven scores. First is the potential for personal challenge and development which stresses creative work and an emphasis on originality and individual ability. The second score is responsiveness to new demands, which measures the individual's reaction to emergency situations, job changes, and irregular job demands. The third factor is competitiveness-desirability and reward of success which emphasize competition and individual accomplishment. The fourth score is tolerance for work pressure. Next is conservative security, which measures if job stability and well-defined job routines are preferred. The sixth score is willingness to seek reward in spite of uncertainty. This would describe an individual who would take an interesting job even though it might only be for a short period of time. The final score surrounds concern measures with emphasis on hygiene job factors. Research with the WCS has reported the relationships of the test to personality test scores, college entrance test scores, and educational aspirations. Cronbach alpha reliabilities range between .65 and .83.

The Work Components Study Alternate Form is a bipolar measure of work orientation versus hygienic orientation. The test consists of 38 items (Borgatta, Ford, & Bohrnstedt, 1973). Each item contains three alternates (2 work-oriented and 1 hygiene or 2 hygiene and 1

work-oriented). Test-retest correlation is reported to be .69.

The WCS Alternate form was correlated with the multi-factor Work

Components Study, and construct validity was indicated.

Ford and Borgatta (1970) have also developed a 59-item questionnaire measuring satisfaction with the work itself. Questions involved ratings of frequency (example: How often do you feel that you are losing interest in what you are doing while you are actually doing it?--always, almost always, very often, fairly often, seldom, almost never, and never) and ratings of agreement or disagreement (Do you feel that rules and procedures about how to do your job are reasonable? -- definitely yes, probably yes, probably no, definite The items were selected to sample attitude toward five job enrichment concepts of achievement, recognition, responsibility, work itself, and growth and advancement. Factor analyses of ratings from several samples yielded the following eight factors: (1) the work itself is interesting, (2) the job is not wasteful of time and effort, (3) I often feel the need for more freedom in planning the job, (4) I have reasonable say on how my job is done, (5) the job provides opportunities, (6) the job provides feedback, (7) the job is too closely supervised, and (8) it is not worth putting effort into the job.

Lynch (1974) developed a measure of the technology of an organization by asking individuals within that organization to rate various aspects of their work environment. Factor analysis and item analysis were used to construct the scale. The following ten factors pertained to the technology of the organization at the individual level: (1) predictability of events, (2) routineness of

operations, (3) insufficient knowledge, (4) overall routineness, (5) interdepartmental task interdependence, (6) internal task interdependence, (7) satisfaction, (8) morale, (9) rules, and (10) job autonomy. The scale discriminated among technologies in 15 functional departments in three academic libraries.

The <u>Job Attitude Scale</u>, developed by Saleh (1971a, 1971b), consists of 120 items involving 16 statements, each being paired with the other in a forced-choice format. Six of the statements involve intrinsic factors (achievement, responsibility, recognition, advancement, nature of work, and growth in skills). The other 10 statements involve extrinsic factors (working conditions, company policy, salary, security, status, technical supervision, salary needs for families' sake, and interpersonal interactions with supervisors, subordinates, and equals).

### Experts' Ratings and Observations of Tasks

Using this approach, jobs and tasks are rated or observed by experts.

#### Requisite Task Attribute Index

Attribute Index (RTA) to measure the attributes of jobs. The RTA index consists of six job attributes which are rated by judges on nine-point scales consisting of five categories from (1) least favorable... (3),... (5),... (7),... to (9) most favorable. The six attributes are variety, autonomy, required interaction, optional interaction, learning time, and responsibility.

Variety consists of one question related to objects in which judges rate the number of different kinds of tools, objects, and controls worked on. The rating scale for this question is (1) 1-4

tools or objects, (3) 5-12 tools, (5) 13-28 tools, (7) 29-60 tools, and (9) 61-120 tools. Motor variety is measured by three questions involving change in work pace, change in physical location and change in required physical operations.

Autonomy is measured by ratings of method choice, sequence choice, pace choice, quality of inputs choice, and importation of outside services choice. An example of the rating scale for sequence choice is: (1) predetermined 90% or more of the time, (3) midway between 1 and 5; (5) partly predetermined, (7) midway between scores of 5 and 9, and (9) 90% of the time the worker sets his own sequence.

Required interaction involves ratings of the number of people with whom the job requires interaction and the amount or quantity of that interaction. Optional interaction <u>is</u> measured by using the larger score between optional interaction on the job and optional interaction off the job. Optional interaction on the job involves ratings of the number of people available and quantity of interaction. Interaction off the job involves the percent of time the individual can choose to go off the job without reprimand.

Learning time is a rating of the time involved, from one week to 32 months, in mastering the job. Responsibility involves ratings of clarity of remedial action for routine problems, time span of discretion, and probability of serious errors.

The total RTA index consists of summated ratings in which double weights are assigned to autonomy and variety while all other attributes are given single weights. The RTA was used by Turner and Lawrence (1965) to rank 47 factory-type jobs.

Another scale from Turner and Lawrence is the Associated

Task Attribute (ATA) scale which consists of judges' ratings of task identity, cycle time, and working conditions on the same nine-point scales. Task identity includes ratings of clarity of cycle or perceived closure, visibility of the transformation to the operator, visibility of the transformation in the finished product, and magnitude of transformation. Cycle time is defined as the duration of the major job cycle. Working conditions include ratings of the room lighting and room cleanliness, gas and fumes, temperature of the room, and cleanliness of machines and immediate job.

Two additional indexes were derived. The <u>Perceived Task Index</u>

(PT) was composed by combining relevant perceived task questions in a manner similar to the construction of the RTA. Workers rated their jobs on nine-point scales. The PT index consisted of the summed total of the workers' ratings of perceived variety, autonomy, interaction, knowledge and skill, and responsibility. The <u>Perceived Opportunity to Contribute</u> (POC) index consisted of the combined rating scores on three questions which emphasized the worker's opinion as to whether or not he had an opportunity to contribute his skill and his ideas usefully in accomplishing the assigned task. Positions Analysis Questionnaire

Another rating scale is the <u>Positions Analysis Questionnaire</u>

(PAQ) which is a structured job analysis. The PAQ consists of 187

job elements organized into six divisions (McCormick, Jeanneret, &

Mecham, 1972). The PAQ is based on worker-oriented rather than joboriented elements. Job-oriented elements tend to characterize what
a worker accomplishes in a job, while worker-oriented elements involve

the nature of sensory, perceptual, and mediational and physical job activities. The six divisions of the PAQ include the following, with an example of the job element included: (1) information inputuse of written materials, near-visual differentiation, (2) mental processes—level of reasoning in problem solving, coding/decoding, (3) work output—use of keyboard devices, assembling/disassembling, (4) relationships with other persons—negotiation, job related personal contact, (5) job context—high temperature, interpersonal conflict situations, and (6) other job characteristics—specified work pace, amount of job structure.

Most of the rating scales are six-point ones using ratings of importance, extent of use or amount of time. Certain items are dichotomous ratings of "does not apply" or "does apply."

Research with the PAQ has indicated that the ratings of attribute requirements for job dimensions of the PAQ have substantial reliability when averaged across several expert raters. An analysis of 62 job ratings by job analysis, supervisors, and incumbents showed average reliability coefficients ranging from .74 to .89. The reliability of each of the individual job elements was found to be .80, average item reliability.

Other research with the PAQ has investigated the attribute ratings of the PAQ and the reliability of job-related ratings as a function of the number of raters (Marquardt & McCormick, 1972), the identification of job dimensions underlying the job elements of the PAQ (Marquardt & McCormick, 1974a), the utility of the PAQ in establishing the aptitude requirements of jobs (Marquardt & McCormick, 1974b),

and the use of the PAQ in establishing compensation rates (McCormick, DeNisi, & Marquardt, 1974).

Other references related to the development of the PAQ include McCormick, Cunningham, and Thorton (1967), DeNise and McCormick (1974), and a summary report by McCormick (1974). A related instrument is the Job Activity Preference Questionnaire (JAPQ) which is an interesting inventory that parallels the job elements of the PAQ in which an individual worker rates his preferences.

As was indicated, the PAQ is based on worker-oriented elements rather than job-oriented elements. Job-oriented elements describe what is accomplished by the worker and the technological aspects of the job. Worker-oriented elements emphasize a worker's behavior and may have broader applications across specific jobs. Allen (1969) studied the worker-oriented versus job-oriented dimension. Twenty verbs were judged to be either job-oriented, worker-oriented, or ambiguous. A sample of college students rated the 20 verbs using the multi-dimensional method of successive intervals. Results indicated that the worker-job orientation continuum existed, but it was too complex to be considered uni-dimensional.

Along the same lines, Bennette (1971) had 36 male subjects judge ten familiar tasks (e.g., buying groceries, mowing a lawn, making a telephone call). The subjects had to indicate which of 25 worker-oriented verbs, such as talk, answer, read, write, think, applied to the task. Factor analysis yielded four broad task dimensions--cognitive, social, procedural, and physical.

# Occupation Analysis Inventory

The Occupation Analysis Inventory (OAI) is a rating device for the description of jobs and occupations. A copy of the inventory

appears in Cunningham, Tuttle, Floyd and Bates (1974). It consists of 622 work elements, which are written descriptions of classes of work activities or conditions, along with specific examples for each class. The five categories of work elements include information received, mental activities, work behavior, work goals, and work context. The work elements are usually rated on three scales:

(1) Significance for the Job (0-5), (2) Extent of Occurrence (0-5), and (3) Applicability (dichotomous scale).

Information received is subdivided into two subcategories—information content and sensory channel. Information content is further divided into 10 categories (e.g., mechanical/electric materials, people/animals, biological, health). An item under mechanical information is:

Indicate the significance to the job of a state of preventive maintenance (whether parts need grease or oil, sprockets are dry, surfaces scratched or pitted, fasteners loose, hoses cracked), (Cunningham, Tuttle, Floyd, & Bates, 1974, p. 49).

Other references pertaining to the OAI include Riccobono and Cunningham (1974) and Tuttle and Cunningham (1974).

Standardized Observations

Recent approaches to task measurement have involved standardized observations. Jenkins, Nadler, Lawler, and Cammann (1975) trained 35 non-professional individuals to observe the characteristics of jobs. A total of 448 employees employed in three different organizations and working at a variety of jobs ranging from operators to managers were observed for two hours and interviewed. The observation instrument included 59 questionnaire-type items measuring a

wide variety of job factors. Raters used 6-point Likert type scales

or 7-point anchored scales. A total of 941 hours of observation were analyzed. Some of the 19 job factors demonstrated repeatability, which was the degree of agreement between two observers rating the same job at different times and at the same time, and homogeneity, which is a measure of concordance or shared variance. The job factors with both high repeatability and homogeneity were variety, autonomy, required skills and ability and meaningfulness. Six of the job dimensions were tested for convergence by comparing the data from interviews with observations. It was found that four of the six had moderate convergence. These job factors were variety, skills, autonomy, and pace control. Certainty and cooperation failed to show convergence. Results indicated that there were a number of methodological problems in this observational approach, including operationalism and conceptualization of job factors, elimination of method variance and systematic error, better training of observers to improve their discrimination among constructs, elimination of observer boredom by simplifying and shortening the measuring instruments, and determining the application of this technique to a wide variety of jobs.

Quinn (1975) observed 370 workers using the observation method of Jenkins, Nadler, Lawler, and Cammann (1975). Five aspects of the tasks were observed as predictors of monotony and boredom. These included the following: (1) number of different tasks performed by the workers, (2) duration of task, (3) repetitions, (4) ratio of duration and repetition, and (5) entropy, which is a mathematical measure of the proportion of the work period devoted to the task. The poorest observational predictor of monotony and boredom was the

number of tasks performed. The best predictor was repetition, the number of times the most frequent task was repeated, and duration was the second best predictor. It should be noted that monotony and boredom were measured by two survey questions.

### Abilities Approach

This approach attempts to isolate and identify the basic abilities required for task performance. The ability dimensions of a task are derived from empirical studies and tests and then factor analyzed. Tasks can then be described and classified by similarities in these ability requirements. Fleishman (1975) believes that this approach has a wider application across tasks and can provide an antegrative framework for understanding task performance.

In Fleishman's conceptualization, ability is defined as a general, relatively enduring trait of the individual inferred from certain response tendencies. Fleishman views abilities as inborn traits with consistency throughout the adult life span contrasted with skill, which is the result of training and involves practice and feedback (Fleishman, 1966).

Fleishman has studied perceptual motor tasks, and through the use of reference tests and factor analyses, has derived an abilities taxonomy to account for perceptual motor performance. The abilities include control precision, multilimb coordination, response orientation, reaction time, speed of arm movement, rate control (timing), manual dexterity, finger dexterity, arm-hand steadiness, and wrist-finger speed and aiming. Studies of physical proficiency have yielded these nine factors of ability: extent flexibility, dynamic

flexibility, static strength, dynamic strength, explosive strength, trunk strength, gross body coordination, equilibrium and stamina (Fleishman, 1966, 1967a, 1967b, 1967c, 1967d, 1975). Additional research has indicated that there are systematic changes in the pattern of abilities that are involved in task performance in early and later stages of training and in predicting performance in transfer of training tasks (Fleishman, 1957a, 1965, 1967c, 1975; Fleishman & Ellison, 1969).

Ability taxonomies have been developed for verbal learning. This taxonomy includes the following ability factors: rote memory, span memory, letter pairs, and anticipation. Research has indicated that rote memory may be the major individual difference learning parameter (Fleishman, 1967b).

The abilities approach has also been applied to vigilancetype tasks. A number of research studies were classified according
to four abilities required for task performance. These abilities
related to vigilance performance include perceptual speed, flexibility
of closure, selective attention, and time sharing. The classification of vigilance studies, according to abilities, improved generalizations about the effects of signal rate, sensory mode, and knowledge
of results on performance (Levine, Romashko, & Fleishman, 1973).
Additional research using an auditory signal identification task
has found that an auditory perceptual ability was most related to
criterion task performance and that this factor increased in importance
as background noise and signal duration decreased (Wheaton, Shaffer,
Mirabella, & Fleishman, 1973).

Recent work has involved electronic fault-finding and problemsolving tasks. From 21 reference ability tests, five factors of
electronic fault-finding tasks were identified. These included:

(1) flexibility of closure, (2) syllogistic reasoning, (3) associative
memory, (4) perceptual cognitive speed, and (5) induction (Rose,
Fingerman, Wheaton, Eisner & Kramer, 1974).

In studies of manipulating these tasks in terms of difficulty and complexity, it was found that subjects changed their approach or strategy in dealing with the task. In general, it was found that knowledge of the individual's problem solving strategy was useful in understanding the relationship of ability requirements to task performance under different conditions of task performance (Wheaton, Rose, & Fingerman, 1975). Recent studies have involved the effect of alcohol on human performance and human abilities (Levine, Kramer, & Levine, 1975).

#### Task Assessment Scales

The Task Assessment Scales developed by Theologus, Romashko, and Fleishman (1973) and Theologus and Fleishman (1973) consist of 37 ability rating scales in which judges graphically rate the abilities which comprise performance on a task. The judges must indicate if an ability is required to perform the task and then must rate, on a seven-point scale, the amount of the ability required. The rater is given definitions of the ability and examples or concrete anchors to aid in their seven-point rating.

The 37 abilities which comprise the scale are as follows: verbal comprehension, verbal expression, ideational fluency, originality, memorization, problem sensitivity, mathematical reasoning.

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THE RELATIONSHIP BETWEEN INDIVIDUAL ATTRIBUTES AND JOB DESIGN: --ETC(U)
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number facility, deductive reasoning, inductive reasoning, information ordering, category flexibility, spatial orientation, visualization, speed of closure, flexibility of closure, selective attention, time sharing, perceptual speed, static strength, explosive strength, dynamic strength, stamina, extent flexibility, dynamic flexibility, gross body equilibrium, choice reaction time, reaction time, speed of limb movement, wrist-finger speed, gross body coordination, multilimb coordination, finger dexterity, manual dexterity, arm-hand steadiness, rate control, and control precision.

Preliminary investigation indicates that the scales possessed substantial construct and predictive validity. The authors have not yet reported cross-validation of these validity results (Theologus, Romashko, and Fleishman, 1973).

# Attribute Requirement Inventory

Other measures of job abilities include the Attribute Requirement Inventory (ARI) which contains 103 definitions of human attributes from the following six categories: general vocational, cognitive, psychomotor, sensory, interests, and needs. (A copy of this scale appears in Neeb, Cunningham, & Pass, 1974). This scale parallels the Occupational Analysis Inventory (OAI). Judges rated the degree of relevance of each ARI attribute to each of the 622 work elements of the OAI. Six separate groups of OAI work elements were intercorrelated based on the attribute requirement profiles. Through a series of factor analyses, 21 interpretable work dimensions were derived. These dimensions are more useful in estimating the ability requirements of jobs than in describing jobs in terms of activities and conditions (Neeb, Cunningham, & Pass, 1974).

#### Other Ability Measures

The Minnesota Job Requirement Questionnaire (MJRQ) represents the dimensions of the General Aptitude Test Battery in operational ability terms (Desmond & Weiss, 1971). The nine abilities are:

General (G), Verbal (V), Numerical (N), Spatial (S), Form Perception (P), Clerical Perception (Q), Motor Coordination (K), Finger Dexterity (F), and Manual Dexterity (M). The MJRQ has five items for each ability, and the rater indicates on a six-point rating scale how important the ability is for successful job performance.

Dawis and Lofquist (1975) have developed a task taxonomy based on ability requirements of the task and reinforcers or needs satisfied on the job. The Minnesota Occupational Classification System (MOCS) classifies occupations on two dimensions. These include Occupational Aptitude Patterns developed by the U. S. Department of Labor. This is a classification system of 461 occupations in terms of 62 ability groupings. The second dimension of the MOCS is the Occupational Reinforcer Pattern Clusters (ORCS). This consists of 21 occupational reinforcers grouped into 12 occupational reinforcer clusters (e.g., ability utilization, achievement, security, responsibility, autonomy, creativity, etc.). The MOCS cross-classifies occupations on the two dimensions and establishes taxons which are defined as clusters of occupations which consist of unique ability and reinforcer characteristics. This taxonomy is psychologically rather than vocationally based and incorporates the authors' Theory of Work Adjustment (Lofquist & Dawis, 1969, 1975).

The abilities approach to task taxonomy has shown to be effective for laboratory performance of tasks. Its applications

operationally may be limited by a number of factors including the economy and feasibility of ability testing for large samples of workers. The findings have not been validated in field settings. Atkinson (1973) believes that job applicants should be assessed not only in terms of the skills found in experienced workers but in terms of the skills required during the training process. In addition, Hinrichs (1970a), in a study of training for a psychomotor task, found that a comparison of ability correlates of proficiency at various stages of learning differed for one group of subjects in which speed was emphasized and for one group in which accuracy of performance was emphasized. Hinrichs concludes that individual differences in approaching tasks may be as responsible for task performance as ability differences. He believes that job samples are more predictive of motor performance than ability reference tests.

# Physical Properties of the Task

This approach involves the measurement of objective characteristics or intrinsic properties of the task.

Hackman (1969a, 1969b) describes four classes of variables which form the "core" of the task performance process and are related to the objective characteristics of the task: (1) the task itself, (2) hypotheses that the performer develops about how to respond. (3) his actual performance, and (4) the outcomes of his performance. Further, previous experience with similar tasks will affect the performer's initial hypotheses about how to approach the task. These intentions are seen as leading to one's actual "work activities." However, the results depend also on the performer's ability, motivation, and general level of arousal. These factors

are also seen as potentially affecting intentions. Finally, the results of the "task process" are evaluated (by the performer or the system), and this feedback affects future behavior. Therefore, Hackman concludes that tasks influence behavior in four ways: (1) through hypotheses control, (2) through arousal of motives (e.g., achievement), (3) through cognitive and physiological arousal, and (4) through the "process-outcome links." According to Hackman, the process is one of "learning the nature of the process-outcome links" (Hackman, 1969a). In effect, what this means is that the performer is learning whether he has the ability to perform at a level which will result in cognitive or physiological arousal and/or satisfaction of aroused motives. This is perhaps the essence of the notion that it is the interaction between abilities and task attributes which determines task perceptions, satisfaction, and performance.

### Task Characteristic Rating Scales

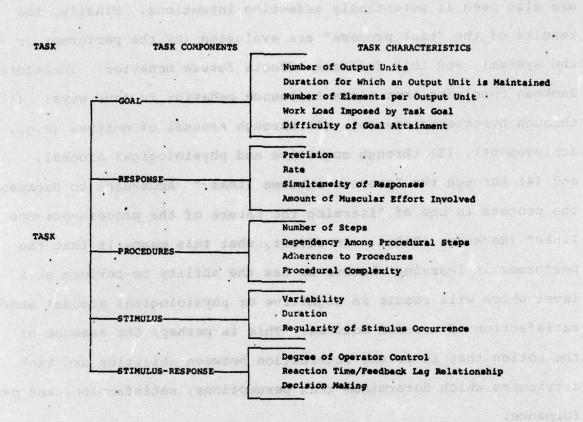
Progress in developing standardized measures of a wide range of physical properties is represented by the work of Farina and Wheaton (1971). They have broken tasks down into five major task components. These include goal, response, procedures, stimulus, and stimulus response. Each task component has a number of characteristics, which are diagrammed as follows:

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(From Farina and Wheaton, 1971, p. 12)

Farina and Wheaton have developed seven-point rating scales for each of the 19 task characteristics. The scales contain both definitions and examples of the anchor points of the scale.

There were problems in interjudge reliability of the scales. The first reliability study involved the ratings of three research assistants. The ratings involved 37 simple psychomotor tasks on the 19 scales. Interclass correlations ranged from -.23 to .75. After revision of the scales, 28 judges (college students) rated 15 tasks on 16 scales. Only 7 of the 16 scales rated showed adequate reliability. The third reliability study involved two judges. Four of the scales appeared to represent reliable scales. The authors

concluded from the reliability studies that the raters should have a background in psychology or human factors, three raters should be used, future development on the scales should involve quantification rather than ratings, and further effort is needed to establish test-retest reliability.

Postdictive designs were used to determine if these scales would predict performance. Subjects rated tasks used in earlier studies on the 19 scales, and then these ratings were correlated with a performance measure of average number of units produced per second. The first postdictive study involved the six most reliable scales (stimulus duration, number of output units, duration of output units, simultaneity of response, number of procedural steps, variability of stimulus location) and 26 tasks, and the second study involved 6 scales and 20 tasks. Significant multiple correlations of .82 and .73 were obtained between task characteristics ratings and the performance measure. The scales were more descriptive of motor tasks than cognitive tasks.

Fleishman (1975) reviews current research with these scales, which involves use of the scales to predict learning time on tasks and the relationship of changes in task characteristics (e.g., signal duration) to changes in ability requirements. Current research indicated that the individual abilities related to task performance change as task characteristics are changed and manipulated.

# Information Processing Measures

Teichner and Olson (1971) use an information processing model in describing tasks and enumerate five different functional task activities which include sensing, searching, coding, switching, and

tracking. Most tasks can be viewed as combinations of these activities. Each of these activities is then defined operationally from basic research in experimental and physiological psychology and signal detection theory.

Tasks can be characterized by the complexity of the input relationship, by the rate of input and output, and by duration. Task activities are then a mathematical function of complexity, rate, and duration. Teichner and Olson define complexity in terms of the number of different possible signals involved in the task and in terms of the proportion of possible signals displayed at one time. In addition, complexity depends on the number of different signals which may be expected during the total task performance. Teichner's whole premise is to develop postulates from the basic research literature to formulate a quantitative model of fundamental behavioral processes underlying task performance.

Bergum (1966) has also developed a taxonomic analysis based on the physical properties of a task and activation theory. A conceptual framework is presented with application to all areas of continuous or repetitive task performance. His theory is based on the assumption that for every given task, there is an optimum range of activation level. Levels below the optimum will yield declines or decrement in performance. Levels above the optimum will produce increased variability and lapses in performance. He then develops a taxonomy of performance tasks which is diagrammed as follows.

MATRIX OF CONTINUOUS PERFORMANCE TASKS

Stimulus	Degree of Stimulation		
	Low (1)	Moderate (2)	High (3)
Source	(Vigilance effect)	(Efficient performance)	(Lapses and high variability)
Relevant	Simple Low frequency Aperiodic	Complex High frequency Periodic groups	Continuous-Compound Continuous Periodic
Mediation	Transduction Low reactivity Low activation	Choice making Normal Moderate	Combination Over-reactivity High activation
Reaction	Simple Low motor Infrequent	Chained Moderate motor Frequent	Complex chained Heavy motor Continuous

(Bergum, 1966, p. 49)

This matrix can then be used to rate tasks in terms of their total stimulation value. Bergum suggests that the matrix can be transformed into a numbers matrix and that by classifying the task at one of the three points along each dimension and totaling these numbers, a figure between 9 and 27 is arrived at which represents a gross measure of the task from which predictions of response decrements or response variability can be made.

A number of other investigators have devised methods of operationally defining job structural attributes. Typically, these investigators define one or a few variables.

For example, Naylor and Dickinson (1969), in research on team or group performance, defined task structure as a function of component complexity, component organization, and component redundancy. Complexity is defined in terms of memory storage demands. Component organization is defined in terms of similar demands imposed by the

total task due to interrelationships among task components. Task redundancy refers to the degree of overlap existing among demands imposed by the several individual task components.

Dickson (1973) studied task variety in four work situations. The purpose of the study was to identify the physical correlates of the work situation which produced variety and to determine the effect of a related variable -- amount of worker discretion or control on variety. Through observation and interviews with auto assembly workers, butchers in a meat factory, meat packers, and cookers in a meat factory, he arrived at a number of conclusions regarding work variety. First, variety in work is a function of time. An operation was defined as a unit of work which takes less than 1-1/2 minutes; a task is a unit of work that takes 1-1/2 minutes to one hour; a batch is a unit of work that takes one hour to two days; and a change of job was defined as a worker being moved after a duration of two days. Batches were seen as the dominant factor in variety except for auto workers. Four different measures of variety were used. These were the number of different tasks performed in a day, the number of changes of tasks in a day, the entropy of the number of different tasks, and the entropy of the number of changes. Entropy is a measure derived from information processing theory and represents the proportion of the work period devoted to the task. Entropy allows for a weighting of the number of tasks performed or units worked on by the duration of the task, unit or batch. entropy measure has also been used by Hill (1975) and Quinn (1975). Dickson concluded that the changes in tasks were more important for task variety than the number of tasks.

The second source of task variation is the amount of discretion a worker has over his work. Dickson enumerates three forms of discretion: (1) discretion over work pace or quantity, (2) discretion over quality of performance, and (3) time span of discretion which is a measure of the longest period of time a worker can be on his own in balancing the pace and quality of his work.

Dickson quantified these forms of discretion in terms of time duration for the four different work situations. These time durations by themselves do not explain differences in variety but when combined with task variety and batch size do indicate that discretion enhances variety.

Dickson's work builds heavily on the time span of discretion theory of Elliott Jacques. This measure is quantified as the longest period of time that a worker can use his own judgment or exercise his own discretion without being reviewed by an immediate supervisor. In a study of 29 jobs in one firm, this time span measure was highly related to the firms' job rankings ( $\underline{r} = .93$ ) and with the wage and salary structure ( $\underline{r} = .96$ ) (Kvalseth & Crossman, 1974).

Quinn (1975), in a study of monotony and boredom, used five different aspects of the task as predictors of subjective feelings of boredom. These measures were: (1) number of different tasks performed by the workers, (2) average time of the task divided by the total number of tasks performed, (3) repetitions, which consist of the number of times the most frequent task was repeated, (4) rates of duration of each task divided by the number of times the task was repeated and summed over all tasks performed, and (5) entropy

(p log<sub>2</sub> p) where p was the proportion of the work period devoted to the task.

Results indicated that repetition and duration were the best observational predictors of monotony and boredom, and the number of tasks performed was the worst predictor. Entropy or ratio measures were not as good predictors as simple measures of repetition and duration.

Standing (1971, 1973) defined task variety in terms of an Ngram analysis. He observed 59 inspectors in a steel mill using a list of generally used operations. The observed sequence of operations were analyzed by an N-gram analysis procedure described by Attneave (1959). This analysis quantifies the amount of information contained in operation sequences and the amount of independent information contributed by an operation within a work sequence. Results indicated that N-gram analysis significantly differentiated between two types of inspectors (coated and uncoated). Coated inspectors put a thin coat of zinc aluminum or lead on the steel. was found that uncoated inspectors had a higher level of mean information contained within their jobs than coated inspectors. However, the simple measure of the number of different operations contained in the job of coated or uncoated inspectors did not differentiate these two groups. The difference in task variety involved the amount of information contained within the different operations. Standing stated:

It is interesting to note that H<sub>1</sub>, H<sub>k</sub>, and H (K-gram) all identified the uncoated inspection jobs as being more varied than the coated inspectors' jobs. On the other hand, these classifications were not distinguishable in terms of what is perhaps the most obvious index of relative job complexity—the number of operations performed. The

suggestion is that information measures are more sensitive discriminators of job variability than is a simple comparison of the number of job operations. (Standing, 1971, p. 61.)

These few examples of direct measures of task characteristics, using an information processing model, seem to point to a productive way of operationalizing task structural attributes. Direct and quantified measures of these properties avoid biases inherent in ratings by incumbents, craft workers, supervisors or experts. In addition, these measures could have broad generalizations across tasks and could improve experimental rigor and control of job design projects and changes. There is a need for more quantification and statistical analyses of results to avoid the previous reliance in anecdotal rather than scientific evidence. In addition, standardized measures of job attributes are necessary to compare research results across job design studies.

# Importance of Job or Task Type for Job Design

Morris (1966), among others, indicates the importance of the type of task on group interaction. In a systematic manipulation of task type, level of difficulty of the task, and ordinal position of the task in the study, significant differences and interactions were found. The group interaction on the production task, where the group was required to structure and answer and to produce solutions, was significantly different from both problem solving and discussion type tasks.

In a review of the literature on group task performance, Hackman and Morris (1975) indicate that it is probably unrealistic to expect a general theory of the relationship between group inter-

action and group performance effectiveness. Instead, they advocate some distinctions among classes of tasks and then do a more detailed investigation of the process-performance relationships within each class. In effect, they are saying that no general law is probably applicable, but there may have to be theories generated for each class.

The important point to be noted here is that none of the theories of job design really take into account the type of task and the real differences between tasks which have been found in the laboratory. In effect, all jobs are perceived to be the same with the implicit assumption that the same job redesign process can be applied to all, giving equivalent results.

Hackman (1968) has both studied and discussed the importance of the task as a determinant of job behavior. In particular, his attempt to classify group tasks and finding that up to 50% of the variance of performance was a function of task type is extremely important. Regrettably, at this stage of the development of the job design field, there has been no comparable taxonomy of tasks corresponding to jobs actually performed in the real world. What is required is the same sort of analysis which has been performed for tasks in group laboratory studies so that when a job design or job redesign project is initiated, there will be some generalizations which can apply to the situation in order to better predict the effects of the job design upon performance.

#### Summary Statements

(1) Current descriptions, classification systems, and measurements of jobs, tasks, and structural attributes cannot be generalized

across tasks, jobs, or workers as they are dependent on the worker performing a specified task or job.

- (2) Each investigator or researcher develops his own unique idiographic operational definitions and measurements of job design related variables. The job design field abounds with ill defined and ill measured constructs and variables.
- (3) Rational task taxonomic systems differ in their conceptual approaches, fluctuate between task requirements and task descriptions, and have not yielded a standardized classification system with wide generalization or integrative power.
- (4) Rating scales, interviews, and surveys are subject to biases including response sets of acquiescence, social desirability, demand characteristics, expectancy effects, and subjectivity of response.
- (5) Rating scales based on dichotomized or 5 to 7 point response categories constrain and restrict the measurement of the wide range and complexities of work performance and attitudes.
- (6) Ratings of jobs and job structural attributes by incumbents, skilled workers, supervisors, and outside experts differ. Workers' ratings depend on prior work experience and are job and worker dependent.
- (7) The Job Diagnostic Survey (Hackman & Oldham, 1974a, 1975) represents a recent development in measurement based on a clear theoretical framework. However, all independent and dependent variables of the theory are measured by the same instrument which may involve an incipient circularity and compounding of error.

- (8) The Requisite Task Attribute index (Turner & Lawrence, 1965) is an example of a rating scale used by experts or judges.

  The scale is based on assumptions regarding the presence or absence of and the weights of critical job structural attributes.
- (9) There are a number of methodological problems in observational and expert rating techniques including operationalism of job factors, elimination of method variance and systematic error, better training of observers, simplification and shortening of rating scales and measuring instruments, and application to a wide variety of jobs.
- (10) Task taxonomies, based on an abilities approach, have been effective in laboratory settings. Findings have not been validated in field studies, and applications of the ability approach may be limited by the economics and feasibility of ability testing of large samples of workers.
- (11) The task-qua-task approach attempts to eliminate bias and provide standardized measures across tasks and jobs.

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#### CHAPTER IV

#### SURVEY RESEARCH: JOB DESIGN

This chapter includes representative survey studies which relate to job design. The voluminous body of research literature on job satisfaction is not reviewed, as only those studies that relate job attitudes to job factors or the broad topic of job design were included. Those survey studies which involved a consideration of the interaction of individual or group variables on job attitudes and job design are reported in Chapter VII of this report. With these limitations, this chapter will include a review of two major topics: (1) survey studies related to job design and job attitudes, and (2) survey data on job enrichment and job redesign projects.

The criterion of a survey study is that it represents a study based on questionnaire type data, an anecdotal review, or a study that does not involve experimental control or manipulation of variables. The distinction between survey data and case or field studies, which are reported in the next chapter, is not always as distinct or clear as a purist might desire.

#### Job Attitudes

The survey data on job design and job attitudes is subdivided into the following categories: general survey data; attitudes toward mass production and job specialization; effects of occupational level, status and skill level on job attitudes; technological effects; attitudes toward job factors; and effects of job factors on health.

These studies are summarized in Table 1 - Survey Studies:

Job Attitudes and Job Design and Table 2 - Major Review Articles:

Job Design, Job Enrichment, Organizational Structure and Climate,

Quality of Work Life, Work Attitudes and Outcomes.

#### General Surveys

The most publicized recent work is the Task Force Report on Work in America. As noted previously, the special task force concluded that work dissatisfaction was pervasive throughout the United States with negative results for the economy, society, and the individual worker (U. S. Department of Health, Education, and Welfare, 1973). The principle sources of work dissatisfaction were reported to be work specialization and decreased work autonomy.

Wool (1973), in a critical essay on the Task Force Report, concluded from his review of available statistics that only about 20% of the work force is dissatisfied and that there is little evidence to support the contention of increased worker dissatisfaction over time. He briefly reviews data on labor turnover, absenteeism, strikes, productivity, and labor force participation; and concludes that the objective evidence does not support rising worker discontent. He calls for a national commitment to full employment as a first step in improving the quality of work life.

Kaplan (1973) reviews recent research and the Task Force
Report and concludes that, while there are pockets of dissatisfaction and alienation among segments of the working force, the
majority of workers appear to be satisfied with their jobs.

Kaplan concluded that job complexity is perceived differently by
workers and that the negative effects of mass production technology
do not generalize to pervasive feelings of social alienation.

Table 1

Major Topic	Type of Workers or Company	N	Survey Instrument :	Major Findings	Reference
General Survey	Survey of Working Conditions (U. S.	proba-	Questionnaire ratings of work aspects.	Workers rated 25 aspects of work. The five work features rated most important were: (1) interesting work, (2) help and equipment to get job done, (3) enough information to get job done, and (4) enough authority to get job done and pay. Of 8 top ranked aspects, 6 had to do with content	Pein (1973)
To resembly			maga Kataba	of workers job. But, blue collar workers held pay higher than interest- ing work.	Tours Tasana
General survey	Gallup polls- longitudinal data. Review of work in America Task Force Report	review essay	Review essay.	Job satisfaction has increased over last 2 decades. While there are pockets of dissatisfaction, the majority of the labor force appears to be satisfied with their jobs.	Kaplan (1973) .
General survey	Review of statistics and worker surveys	review article	Surveys	Turnover and labor unrest are less pervasive today. Mixed evidence concerning quality of work. Skill level of workers is in- creasing. Little evi- dence of positive effects of work redesign.	(1974)
General survey	Probability sample of workers	1496	Quality of employ- ment survey	Comparisons made between the 1969 survey of working conditions and the 1973 survey showed that few significant changes occurred in workers' needs and attitudes. Increasing numbers of workers have become locked into their jobs. Experiments with working hours, job enlargement, and job enrichment have made no appreciable impact on national statistics.	Quinn & Shepard (1974)
General survey	and research (1958-1973)	research		(1) no evidence decline in job satisfaction (1958-1973), (2) job satisfaction lower in blacks, younger workers, service workers, operatives, and clericals, (3) differences in job satisfaction by education level, (4) availability of resources to do job and job challenge rater higher than financial rewards, (5) differences in ratings of job factors by type of job, sex, etc. (6) job satisfaction related to physical and montal health, (7) no evidence on direct relationship, satisfaction, and productivity, (8) satisfaction related to turnovar, absenteeism, and theft, and (9) work redesign too unscientific to be evaluated.	

Table 1 (Cont'd.)

Major Topic	Type of Workers or Company	Mary Miles	Survey Instrument	Major Findings	Reference
General survey	Three national surveys: white collar and blue collar workers, interviews with blue collar , workers	371	Surveys, interviews	1) Worker dissatisfaction was widespread and was based on dehumanizing aspects of technology. 2) Dissatisfaction experienced most by black workers under 30, young workers with some college experience and young men. 3) Dissatisfaction can lead to socially and politically destructive attitudes and behavior.	Sheppard & Herrick (1972)
General survey	Probability sample of workers	1533	Interviews	90% of workers identified	Center (1971)
General survey	Report of task force on quality of work life in America	not appli- cable	Review of available research	Report includes review of functions of work, worker dissatisfaction, physical and mental costs of worker dissatisfaction redesign of work, vocational development, federal policy, and conclusions. Report concludes that although work ethic is alive a large number of workers at all occupational levels are dissatisfied with work. Principal sources of discontent are work specialization and diminished work authority Results of discontent are decreased productivity and quality, increased turnover and absenteeism. Work is related to physical and mental problems of workers.	of Health,
General survey	Not reported	Not re- ported	Not reported	90% of individuals sampled are reasonably satisfied with work.	U.S. Office of Management and Budget (1973)

Major Topic	Type of Workers or Company	Maria Maria	Survey Instrument	Major Findings	Reference
General survey	Gallup polls (1963-1969) males twenty-one or older and. full-time workers	sample sixes 1488 699 1403 711	One question On the whole, would you say you are satisfied or dissatisfied with the work you do?	Results: 1) positive r between income and satisfaction, 2) positive r between housing situation and satisfaction, 3) little variation between levels of education and satisfaction, 4) higher satisfaction for professional, farm, and skilled workers, 5) blacks indicate lower satisfaction than whites, 6) no consistent trend between absenteeism and satisfaction, 7) males living in higher households indicate higher satisfaction.	Weaver (1974)
General survey	Representative survey sample.	1500	Select 1 out of 5 job characteris- tics as most important.	Intrinsic job character- istics most important to both white and blue collar workers. Difference and similari- ties between white and blue collar workers are reported.	Weaver (1975)
General survey	Comments on task force report work in America	not re- ported	Surveys	Only 20% of work force is dissatisfied. Maslow-Herzberg model fails to take into consideration inflation and economic security.	Woo1 (1973)
Large sample	62 different jobs in 7 organizations	658	Job Diagnostic Survey	Reliability and validity data on Job Diagnostic Survey.	Hackman & Oldham (1975)
Large sample	100 different jobs in 12 organizations	1000	Job Diagnostic Survey	High growth need workers with jobs high in moti- vating potential were higher in motivation, lower in absenteeism and somewhat more effective in performance	Hackman, Oldham, Janson, & Purdy (1975)
Large sample	Electronics manufacturing company - blue collar workers	1500	Fixed alternative questionnaire.	Employee oriented super- vision was associated with high social cohesion and low perception of work pressure as opposed to product oriented supervision.	Klein & Ritti (1970)
Large sample	Naval enlisted men	5851	Questionnaire	Righer satisfaction for clericals, cook, and ordinance job workers. Low satisfaction for temporary duty assignments and deck assignments. Multiple r = .49 was obtained between 6 variables (type of duty, length of service, specific ship, health,	McDonald (1972) McDonald & Gunderson (1974)
	what here is with the control of the			survey score, and number of co-workers) and job satisfaction.	Transfer at
Large sample	White collar workers	3628	Questionnaire	Those new on a job are more intrinsically oriented than those who have mastered the	Saleh & Pasricha (1970)
Large sample	White collar organization	4379	Questionnaire	challenge of a job. In high salary group (over 10,000), job mobility related to in- trinsic-extrinsic moti- vation.	Saleh & Pasricha (1975)

Major Topic	Type of Workers or Company	N	Survey Instrument	Major Findings	Reference
Large sample	Two plants international company	hourly = 772 salaried = 379	Survey questionnaire	Salaried groups had more favorable attitudes than hourly. A more clear cut positive relationship was found between job attitudes and efficiency for hourly than salaried employees.	Saleh, Prien, Otis, & Campbell (1964)
Large sample	White collar organization	3000	Ouestionnaire	Low skilled subjects whose fathers were unskilled were less intrinsically oriented than subjects with technical or professional fathers. Positive correlation between intrinsic job orientation and community size for low salaried groups. Modifferences in high salaried groups in regard to fathers occupation or community	Saleh & Singh (1973)
Large sample	6 manufacturing	2628	Questionnaire	size. Job involvement was sig-	Siegel & Ruh
(S) (S) 100 (S) (S) (S) (S) (S) (S) (S) (S) (S) (S)	components		9533 - 100220 - 101 (123 - 100220 - 101 (123 - 100220 - 101	nificantly correlated with participation in decision making, community size, and turnover. Job involvement was not related to performance or absenteeism. Correlation between participation in decision making and job involvement was greater for urban than rural type workers.	(1973)
Large sample	Female manual workers in electronics plants	2543	Questionnaire	Self-actualization factor was most related to over- all job satisfaction. Urban type workers are better disposed to accepting rationalized and pace work. Rural workers had more favor- able accitudes toward their pay. Plant size affected relationship between population characteristics and job attitudes.	
Mass production Job specializa- tion	Auto workers (India, Argentina Italy, U. S.).	1092	Interviews	Most workers satisfied	Form (1971, 1973a, 1973b, 1975)
Mass production Job specializa- tion	Auto workers assembly vs. utility workers	- 415	Questionnaire 14 job content areas	No difference attitude assembly vs. regular utility workers. Utility workers in enlarged jobs moré favorable attitude.	Kennedy & O'Neill (1958)
Mass production Job specializa- tion	Assembly workers radios and TV	females 141 males	Two interview questions - small vs. large jobs; belt vs. push lines	Most workers preferred small jobs (51%) and belt lines (84%).	Kilbridge (1960a)
Mass production Job specializa- tion	Female machine operators	200 -	Interviews surveys	Work attitudes not re- lated to efficiency ratings, monotony or boredom. Work attitudes were related to absen- teeism, supervision, emotional adjustment	Kornhauser & Sharp (1932)

Major Topic	Type of Workers or Company	N	Survey Instrument	Major Findings	Reference
Mass production	Auto assembly	50	Interviews (con-	Three attitudinal factors	
Job specializa- tion	workers (male) Electronic assemblers (female)	29	tent analysis and factor analysis)	affective, instrumental, and job involvement. Two technological variables: variety and assembly- line syndrome.	
Mass production Job specializa- tion	Ofl refinery workers Auto assembly Auto craftsmen	109 120 143	Likert Scale Job Satisfaction	Negative r degree of functional specializa- tion and job dissatis- faction.	Shepard (1970 1971)
Mass production Job specializa- tion	Three factories. Two automobile One rolling metal mill	976	Interviews	Evidence supports traditional model that relates uniformity and repetition in work to dissatisfaction. Monotony and boredom higher in mass produc-	Walker & Marriot (1951)
Mase production Job specializa- tion	Female workers ex-workers	2159 236	Forced-choice questionnaire structured interview.	tion than rolling mill.  21% of present workers and 36% of ex-workers expressed overall dis- satisfaction with their jobs which were of a highly rationalized type. Voluntary labor turnover related to dissatisfac- tion with work itself.	Wild (1970) Kempner & Wild (1973)
Occupational Level	Skilled craft employees vs. unskilled and semi-skilled machine operators	300	Questionnaires	Skilled workers more concerned, quality, greater interest work, higher self-concept, more social activities.	Argyris (1959)
Occupational Level	Engineers Unskilled assemblers	200 153 . ,	Questionnaires	Engineers rated content factors as more important; assemblers, context factors.	Armstrong (1971)
Occupational Level	Cross-section working population	692	Select three most important job factors from six	White collar valued intrinsic job factors; blue collar, extrinsic; no sex difference except females valued	Centers & Bugental (1966)
Occupational Level	Civil service: white collar workers, blue collar workers	1047White 421 Blue	Questionnaire	White collar workers concerned with self-actualization. Blue collar workers concerned with comfort, security, and interpersonal relations.	Friedlander (1965a, 1965b, 1966)
Occupational Level	Workers in 16 industries	3000		93% of urban university professors answered yes while only 16% of un- skilled auto workers answered yes.	Kahn (1973)
Occupational Level	Professional vs. nonprofessional workers in R & D Center	not re- ported	Questionnaire	Professional scientists interested in work itself and opportunities for achievement and freedom on the job. Non-professional personnel interested in job security, salary, and working conditions.	Kaplan, Tausky & Bolaria (1969)
Occupational level	Manufacturing employees	survey of 16,000	How much of your work could be handled by a per- son of less train- ing or experience?	46% production workers, 24% engineers, and 15% managers answered great	Sirota (1973a)
Technology	Printers Textile workers Auto workers Chemical workers	115 400 180 78	Interviews and survey data	Printers and chemical workers most integrated; alienation highest among auto and textile workers; technology determines alienation.	Blauner (1964)

Major Topic	Type of Workers or Company	N	Survey Instrument	Major Findings	Reference
	Manual workers	1491	Questionnaire	Oil workers most in-	Fullan (1970)
Technology	printing, auto, and oil industry	1491	Questionnaire	tegrated, followed by printers, then auto workers. Continuous process (oil), industry, and craft, and mass	Fullan (1970)
	Classic Street		1 AC 1 21 ES	production differ in socio-technical systems.	
Technology	Bank employees	150	Survey	4% computer personnal, 48% clerical workers, and 64% of machine operators experienced work	Kirsch & Lengermann (1972)
Technology	Blue collar	206	Interview	alienation. Negative r. technical constraints, and social interaction on job and in leisure activities.	Meissner (1971)
Technology	26 plants continuous process		Ratings of experts	Automation per se does not reduce alienation in continuous process produc- tion. Other factors are involved including work groups, status gradients,	
				work variety, and freedom.	
Technology	Chemical workers	not speci- fied	Interview	Workers in continuous process jobs more satis- fied than in batch jobs. Tradesmen more status conscious than manual workers.	Wedderburn & Crompton (1972)
Job Factors	Midwest Manufacturing Company Public workers	99	Questionnaires; core task dimensions; satisfaction; higher order need strongth	No sign age difference in perceived autonomy, skill variety, or feedback. Poth younger and older workers were satisfied with higher levels of these dimensions.	
Job Factors	Manufacturing Company	300	Questionnaire rating of jobs on complexity.	Satisfaction with use of skills and ability in- creased as job complexity increased, but there was less satisfaction with supervision.	Alderfer (1967)
Job Factors	Blue collar/white collar workers	1390 blue collar 511 white collar	Job Descriptive Index (JDI), Job in General (JIG), Life in General (LIG).	In alienated communities the correlation between job level and satisfaction was50. In integrated communities, the correlation was +.40.	Blood & Hulin (1967)
Job Pactors	Census data (1950, 1960, & 1970)	55,000- 74,000	DOT. Dictionary Occupational Titles.	Total number of workers employed in discretionary jobs has increased from 1950-1970, but percentage of discretionary jobs has stayed the same. More blacks and females in non-discretionary	
Job factors	Marketing	1600	h	jobs: 55% of workers have discretionary jobs.	
es (e fa caso)	organization	<b>~800</b>	prince peak his co	Nine factors of satis- faction identified: 1) work itself, 2) job demands, 3) management, 4) pay, 5) future, 6) company, 7) associates, 8) obstacles, 9) securi- ty. Attitudes about company and work itself comprised major share of overall job satisfaction variance.	Hinrichs (1968)

Major Topic	Type of Workers	N	Survey	Major	Pafavana
Major Topic	or Company	N	Instrument	Findings .	Reference
Job factors	Telephone	556 -	Job Description	Job scope indices (variet	Porter & Stone
	employees - 16	593	Index JDI; Hackman		
	craft jobs		& Lawler (1971)	satisfaction with work	Stone & Porter
			8 job factors;	itself. Alienation model	
	The state of the Phase State of		questionnaires	of Hulin & Blood (1968)	
		6 S S S S S S S S S S S S S S S S S S S		not supported. Job '	1
	1 0 00000000000000000000000000000000000			titles explained 53% of	
	70.00			attitude variance.	
Job factors	Managers	1310 .	Questionnaire	There is little re-	Ronan (1970a,
	Salaried	3641		lation between satis-	1970b)
	Hourly	6212		faction and work	
		• 4		behavior. 68 job	
		William Female		characteristics were	
				rated for importance and	
				there was relative	
			ļ	agreement among workers.	
Job factors	Non-union .	N=110	Questionnaires;	As job difficulty in-	Svetlik, Prien, &
	employee's .		Expert ratings of	creased, attitudes were	Barrett (1964)
	1		job difficulty;	more positive; supervi-	
	1		Supervisor's	sor's rating of job	
			ratings of per-	competence related to job	
			formance.	difficulty	
Job factors	British factory	5274	Questionnaires	Workers on production	Taveggia & Hedley
	workers			lines perceive less dis-	(1974 , 1975)
				cretion than non-produc-	1
				tion workers in relief	
				opportunities, physical	
		1		movement, work speed,	
				slack time, and work	
				variety. There is varia-	
				tion in workers' percep-	
				tions of job discretion,	
				Perceived job performance	
				discretion is only	
		( .		marginally related to	
				satisfaction. Weak posi-	
				tive relationship is	
				found between job special-	
				ization and work dissatis-	
			•	faction regardless of	
				middle class work values	
				or alienation.	
Health	Working men	780	Questionnaires	Perceived incongruence	Coburn (1975)
				between complexity of	
				work and ability to	
				handle; this resulted in	
				poorer mental and	
<u> </u>				physical health	
Health .	Managers,	206	Questionnaires	Goodness of fit between	French (1973)
	engineers, and		Physiological	environment and indivi-	
	scientists from		measures	dual necessary for	
	Space Center		•	physical and mental	
				health of worker; misfit	
				results in physiological	
	<u> </u>			and psychological stress.	
Health	Research lab	331	Company medical	Did not find inverse re-	Kas1 & Cobb (1964)
		male	records	lationship between	
				occupational status and	
				dispensary visits.	
Health	Blue coliar	6.000	Company medical	Inverse relationship,	Kasl & French (19
			records	skill level, and	
		1		dispensary visits.	
Health	Auto workers	655	Interviews	Lower skill level of	Kornhauser (1965)
				worker, poorer mental	See also
		1		health; job specializa-	McWhinney &
				tion and simplification	Adelman (1966)
			1	cause poor mental health	
Health .	Office workers	100	Questionnaires	Factory, unskilled	Pym (1963)
	factory workers	100	Inventories	workers more frustrated	
	teleprint			than office or skilled	
	operators ·	60		workers. Unfavorable .	
	engineering.	1 4 3 7	1	job attitudes related	
	apprentices	A CONTRACTOR OF THE PARTY OF TH		to frustration.	

Table 1 (Cont'd.)

Major Topic	Type of Workers or Company	N	. Survey Instrument	Major Findings	Reference
Health	Auto workers and spouses	888	MacMillan Index (Mental Health) Satisfaction Questionnaire	95% satisfied with work. Automobile workers revealed no more evidence of loneliness, boredom, life dissatisfaction,	Siassi, Crocetti & Spiro (1974)
•				work dissatisfaction, or depression than among their spouses.	

Sales and Control

Table 2

Major Review Articles: Job Design, Job Enrichment,

Organizational Structure and Climate, Quality of Work Life, Work Attitudes and Outcomes

Major Topic of Review	Type of Review/Dates	Conclusions	Reference
Job Design - General	Report of working meeting: Job Design	Job analyses, job design, job derived employment criteria, task taxonomies.	Barrett & Dambrot (1975a)
Job Design - General	Review of applied research: Assembly lines	Eight guidelines concerning length of line, pacing, products, buffer stock, etc., suggested.	Chase (1975)
Job Design - General	Theoretical review Man-task technology	Future of industrial production technology lies in area of information processing and computer control of production	Cooper (1972)
Job Design - General	Postwar research Repetitive tasks	The most preferred jobs are well-organized and call for one's full attention or none at all.	Cox (1970)
Job Design - General	Review of field studies 1948-1958	(1) Cut batch size from 1/2 day supply to 1-1/2 hours. (2) Batch size preferences differ for new workers and piece-rate workers. (3) Longer work cycles desirable as they allow balance between operators. (4) Need buffer stock to allow for individual variations in work rate.	Cox & Sharp (1951)
Job Design - General	Survey of work experiments Monotony	Temperament most related to decrement in performance vigilance tasks.	Davies (1970)
Job Design - General	Readings on job design	Job design from a sociotechnica systems approach.	Davis & Taylor (1973)
Job Design - General	Collection of papers and essays Automation	Disruptive effects of technological change on workers' feelings of job security and self-confidence.	Dunlop (1962)
Job Design - General	Review of field of quality control inspection.	Practical applications for industrial inspecton including job design, measuring performance, selection of employees.	Harris & Chaney (1969)
Job Design - General	Report of series of studies of male and female manual workers on effects of changes in job design and job content on worker productivity - mass production.	Problems of job design are complex, multivariate and consequently, the derivation of principles or procedures for job design should be pursued in specific circumstances.	Kempner & Wild (19 Wild (1975)
Job Design - General	Review of studies relating job specialization and job satisfaction.	Concluded that the issue was not yet settled and that individual differences are ignored.	MacKinney, Wernimon & Galitz (1962) Warren (1958) Factory (1963)
Job Design - General	Review of research 1957-1959 Job Design Task Taxonomy	Field requires a taxonomy of tasks to provide a framework for generalization of job design systems, training, and performance.	Melton & Briggs (1960)
Job Design - General	Review of literature 53 experiments on vigilance- inspection tasks	Effects of stress and prolonged work sessions on vigilance tasks.	Poulton (1973)
Job Design - General	Review article Job analysis	Job analysis can range from minute descriptions of industrial engineers to global ratings used in wage and salary administration.	Prien & Ronan (1971

Major Topic of Review	Type of Review/Dates	Conclusions	Reference
Job Design - General	Theoretical review	Reviews several approaches to job design: (1) Job enlargement. (2) Modified work week.	Sandler (1974)
517437 E3985	t in about the control of the contro	(3) Problem solving. (4) Responsiveness to employees' needs. Recommends cafeteria approach	one. Note the
Job Design - General	Theoretical review of	(let employees select alternatives).  Generalization of activation	Scott (1966)
· ·	activation theory	theory to job design. Lack of arousal affects performance on repetitive jobs.	panes - spissor des
Job Design - General	Review book automation	Fact and opinion regarding effects of automation on industrial relations.	Shils (1963)
Job Design - General	Daydreaming	Three patterns of daydreaming identified: (1) Fearful fleeting	Singer (1974)
		daydreams. (2) Emotional unpleasant daydreams. (3) Positive future planning.	
	200	Daydreaming maintains varied stimulation and may improve performance.	
Job Design - General	Review of literature effect of age and personality variables on assembly line boredom	Blue-collar workers show steadily increasing job satis- faction with age. Less older workers on assembly lines	Stagner (1975)
	porecom	because of seniority, job change, or early retirement. Young workers with strong	
		nervous system arousal, sensation seeking, high extra- version, and low ego strength do not adapt well to assembly line work.	
Job Design - General	Review of current job design procedures	Ergonomists need to shift focus from knobs and dials to systems designer.	Swain (1973)
Job Design - Tasks	Theory and seven experiments Task experience and attitudes	Theory states that task experi- ence serves as an important determiner of individual and group attitudes, beliefs, and	Breer & Locke (1965
		values. Individuals respond to a task cognitively (under- standing nature of task),	
TERRITOR AND	en control of the second of th	cathetically (developing positive attachment for task), and evaluatively (defining task behavior as legitimate	
100-14 × 0-104		or morally desirable). Attitudes generalize in a lateral (from specific - specific) and vertical (from	
Job Design - Tasks	General review article Task Taxonomy	specific - general).  Four approaches to task classification: (1) Rehavior description	Fleishman (1975)
Section of the sectio		(2) Behavior requirements (3) Ability requirements (4) Task characteristics	09067 - 80/100 EC
Job Design - Tasks	Theoretical review	Task factors control up to 50% of variance. Presents frame-work for describing and analyzing tasks.	Hackman (1968, 1969a, 1969b)

Major To	pic of Review	Type of Review/Dates	Conclusions	Reference
Job D	esign - Tasks	Review of literature and proposed integration Group effectiveness	Key to understanding group effectiveness problem is study of ongoing group interaction process, while they are working on a task.	Hackman & Morris (1975)
Job D	esign - Tasks	Report on 13 experiments Training-assembly task	Comparison of different training methods (written, audio tapes, audio visual, etc.). Slide booklet approach has highest benefit/cost ratio.	Konz & Dickey (1969
Job D	esign - Tasks	Classified tasks used in 53 studies of vigilance.	Classification of tasks, according to an abilities taxonomy, clarified relationships between several independent variables (e.g., signal rate, knowledge of results) and performance.	Levine, Romashko, & Fleishman (1973)
Job D	esign - Tasks	Review of task taxonomy	Presents a taxonomic system of human performance tasks. Review of taxonomic science.	Gagne (1963) Miller (1967) Sokal (1974)
Job D	esign - Tasks	Symposium - Task factors	Effects of task factors on job attitudes and behavior.	Porter (1969)
Job D	esign - Tasks	Theoretical article - Tasks	Application of experimental and physiological psych theories to task performance (signal detection theory)	Teichner & Olson (1971)
Job Er	nrichment	Case studies	Case studies and commentaries on job restructuring.	Davis, Cherns, & Associates (1975b)
Job Er	nrichment	Review of major projects	Intrinsic nature of job is secondary to many workers. Of primary concern are pay, job security, rules of work place. Job design should balance intrinsic and extrinsic factors.	Fein (1970, 1974)
Job Er	nrichment	Report on field studies A.T. & T.	19 field studies review. Improving work through job enrichment results in higher motivation and improved productivity.	Ford (1969a, 1969b)
Job Er	nrichment	Report on programs at four , companies.	Poloroid, Texas Instrument, A.T. & T.; and H. B. Hood, all reported as successful.	Foulkes (1969)
Job Er	nrichment	Review of case histories of major job redesign projects	Job redesign will result in improved productivity and improved quality of work life.	Glaser (1974)
Job Er	nrichment	Reviews research linking job satisfaction to job size.	A model which relates job size to satisfaction depending on a third variable (alienation of the workers from middle-class work-related values and norms) is presented.	Hulin & Blood (1968)
Job Er	nrichment	10 enrichment projects reivewed/1950-1966,	Concluded that job enlargement leads to increased quality rather than increased productivity.	Lawler (1969)
Job El	nrichment	. Readings book	Case studies of job . enrichment projects at American companies.	Maher (1971)
	nrichment ys of Companies	Companies using job enrichment	Few major companies are formally involved in job enrichment. Operational issues are major reason for job design.	Reif & Schoderbek (1966) Schoderbek & Reif (1969) Luthans & Reif (1974 Wild & Birchall (197

ajor Topic of Review	Type of Review/Dates	Conclusions	Reference
Job Enrichment Quality work life	Series of essays	Overview of work in America. Changing work ethic. Consequences of worker dissatisfaction. Review of work restructuring.	Rosow (1974)
Job Enrichment	Review of seven job enrichment studies.	Discusses predominant methods of job design and an analysis of company and union experience with job design in application including guidelines for and barriers against job design.	Rush (1971)
Job Enrichment	Review of literature	Job restructuring results in increased performance and satisfaction if individual workers are provided with autonomy, task variety, and feedback.	Srivastva, Salipante, Jr., Cummings, Notz, Bigelow, 6 Waters (1975)
Job Enrichment	Review book on nine case studies from United Kingdom and Europe.	Review of successful projects. Book attempts to bridge gap between academia and managers, research and application, and theory and practice.	Taylor (1972)
Job Enrichment	Review of job enrichment projects.	Tabular presentation of 34 job enrichment projects.	U. S. Department of Health, Education, and Welfare (1973) (Task force report Work in America)
Job Enrichment	Eight companies.	Slow diffusion of pilot projects in 8 companies.	Walton (1975)
Job Enrichment Mass Production	Review of current practices, trends, and developments in mass production of discrete items.	Examines effects of mechaniza- tion, automation and job restructuring on assembly work. Review of United Kingdom; U.S.A., and European work redgaign projects.	Wild (1975)
Organizational Structure - Climate	Theoretical Review Socio-Technical Systems	Review of Tavistock Institutes work, and theory of socio- technical system.	Cooper & Foster (1971)
. Organizational Structure - Climate	Review of socio-technical systems.	Design of socio-technical systems. Task characteristics and organizational structure.	Herbst (1974)
Organizational Structure - Climate	Review of literature Organizational Structure	Three categories of measurement of climate are: (1) multiple measurement-organizational attribute, (2) perceptual measurement-organizational attribute, and (3) perceptual measurement-individual attribute approach.	James 6 Jones (1974
Organizational Structure - Climate	Theoretical review Organizational theory	Four conceptual approaches to organizational theory: (1) traditional structural approaches (Marx & Weber), (2) modern structural approach (Argyris & McGregor), (3) personalistic views.(perceptual theories), and (4) integrating approaches & system and role models).	Lichtman & Hunt (1971)
Organizational Structure - Climate	Review of research relating organizational structure to job attitudes and behavior.	Relationships found include: (1) positive r between height of organizational structure and satisfaction and perceived necessity for interdirected job behavior, (2) positive r between line type organization and degree of need satisfaction (3) negative r between subunit size and job satisfaction, and (4) positive 4 between subunit size and absenteeism and turnover. Need satisfaction is more related to structural properties than is need importance.	aweed to the or

ajor Topic of Review	Type of Review/Dates	Conclusions	Reference
Quality work life	Review of basic assumptions and criticisms of quality of work life movement.	Assumptions include technical variables, needs of workers and values of autonomy, high skill level, and self-realization through work. Criticisms include economic, political, and social issues.	Cherns (1975)
Quality work life	Report of International Conference on Quality of Working Life 9/1972 and Planning Committee.	Thirty-siz original articles assessing quality of working life, including problems, prospects, and the state of the art (1975a).	Davis, Cherns, & Associates (1975a)
Quality work life	Review of research on job attitudes (8 studies).	(1) One in eight workers are dis- satisfied, (2) Morale trend is as follows: new employees have high morale, there is reduced morale during middle twentics to early thirties and then increasing with age, (3) Higher level jobs result in higher satisfaction,	Hersberg, Mausner, Peterson, & Capwell (1957)
Minest & Color (1995) (Color (1995) ) (Color (		(4) Job satisfaction is related to job tenure and possibly to productivity, (5) Supervisors who are employee-centered achieve better productivity than those who stress production, (6) Prevocational job counseling can lead to better job placement and higher job satisfaction, and (7) In the area of industrial mental health, the following generalizations are made: acci-	
0/50 <sub>4</sub> S de /55		dents are related to emotional depression, almost twice as many man-hours are lost from mental illness as from the common cold, and workmen's compensation for mental illness is becoming more frequent.	uprosses st
Quality work life	Review of literature on alienation of automobile workers in four countries conducted between 1962-1967.	Anomie observed was related to the extent of industrialization, but place in the skill hierarchy and pattern of system involvement were associated with anomie differently in each country. In the less developed countries, beliefs concerning societal anomie were not related to skill level or pattern of system involvement, as in the U.S., but to political ideology and ability of workers to see linkages between unionand national politics.	Porm (1975)
Quality work life	Review of literature relating functional specialization and work satisfaction.	Concludes that there is negative relationship between degree of functional specialization and degree of job satisfaction.	Shepard (1969, 1971
Quality work life	Annotated bibliography on empirical research (1959-1972) that deals with the quality of work life.	Views quality of work life as a phenomenological experience of people at work.	Taylor, Landy, Levine, & Kamath (1972)
Quality work life	Theoretical review	8 salient features of quality of work life: (1) Compensation, (2) Working conditions, (3) Use of human skills, (4) Growth and security, (5) Social integration (6) Democracy, (7) Work and life and (8) Social Relevance.	Walton (1973)
Theory Construction and Validation	Review of studies Two-factor theory	\$1\$ of factors contributing to job satisfaction were motivators or intrinsic. 69\$ of factors leading to dissatisfaction involved hygiene or extrinsic factors.	Herzberg (1964, 1966) 1968, 1971) Herzberg, Mausner, & Snydermen (1959)

Table 2 (Cont'd.)

Major Topic of Review	Type of Review/Dates	Conclusions	Reference
Work Outcomes	Review of literature on satisfaction and performance.	There is little evidence that employee attitudes bear any simple or appreciable relation- ship to job performance. Also, there is a significant, but complex, relationship between attitudes and absences.	Brayfield & Crocket (1955)
Work Outcomes	Review of studies Ability motivation performance	Concludes that ability differences are empirically the most important determinants of differences in job performance.	Dunnette (1973)
Work Outcomes	Review and evaluation of research Satisfaction - productivity	(1) Limited programs (e.g., job enrichment) will not create long-range improvement in satisfaction or productivity, (2) Socio-technical systems which include redesign of all aspects of work seem to be promising approaches, and (3) review includes job enrichment projects, management by objectives, Scanlon plans, and system wide studies.	Katzell, Yankelovich, & Others (1975)
Work Outcomes	Review of literature, satisfaction, and performance.	Presents a theoretical model in which satisfaction is caused by performance. Implications stated for job design interventions.	Lawler & Porter (1967a, 1967b) Lawler (1970, 1973) Porter & Lawler (1968a, 1968b)
Work Outcomes	Literature review, 10-12 years Absenteeism and turnover	Overall job satisfaction is negatively related to turnover. There are four satisfaction categories (organization-wide factors, immediate work environment, job-related factors, and personal factors) that are related to turnover.	Porter & Steers (1973)
Work Outcomes	Literature review Tenure	Summarizes studies of labor turnover in relationship to individual variables and job satisfaction. Recommendations for future research are given.	Schuh (1967)
Work Outcomes	Review of research literature (600 correlational and field studies) Performance Satisfaction	Correlational studies: (1) Intrinsic nature of work positive r satisfaction and performance; negative r absenteeism and turnover, (2) Autonomy positive r satisfaction and performance, (3) Democratic and supportive supervisory style positive r to satisfaction. Democratic supervision may be either positively or negatively related to performance, (4) Organizational climate positive r to satisfac-	Srivastva, Salipante, Jr., Cummings, Notz Bigelow, & Waters (1975)
TORE THE STEWN	tenden a control della daken to control statut a tenden statut and tenden tenden statut and tenden and tenden statut and tenden and tenden statut and tenden and tenden	tion. Field studies: (1) Socio- technical changes toward making work groups more autonomous are likely to result in increased satisfaction and performance when groups are provided with whole complete task, work dis- cretion, feedback, and variety of task skills, (2) Job re-	METT STOL STOLE
		structuring results in increased performance and satisfaction if individual workers are provided with autonomy, task variety, and feedback, (3) Participative management results in increased satisfaction, (4) Organization change which reduces hierarchial levels increases span of control,	worl stow were
\$100 · 100 0 100		and introduces new line and staff positions lead to increased productivity.	10.00 max 10.00

Fein (1973) reanalyzed data from a 1970 Survey of Working Conditions Report (Survey Research Center, 1971). This report involved a probability sample representing occupational groupings in the United States who were asked to rate the importance of 25 job factors or aspects. The eight top rated aspects by all workers were: (1) interesting work, (2) enough help and equipment to get the job done, (3) enough information to get the job done, (4) enough authority to do the job, (5) pay, (6) opportunity to develop special abilities, (7) job security, and (8) seeing the results of one's work. Of the eight top rated aspects, six concerned the work content.

Fein reanalyzed the data by occupational groupings and found that there were distinct differences in the ratings by three blue collar occupational groups as compared to composite or overall ratings. Interesting work, which was ranked first by the sample as a whole, dropped to ranks of 3, 5, and 7.5 for blue collar groups.

Job security and good pay were ranked higher by blue collar workers than the sample as a whole. Fein concluded that there are basic differences between blue and white collar workers as well as differences between various types or categories of blue collar workers. He has used a figure of 15% - 20% to represent the proportion of workers who are so called high achievers who want challenging, responsible jobs and are involved with their jobs (Fein, 1970). He believes that 80% - 85% of the work force are non-involved workers.

Sheppard and Herrick (1972) report that for their sample of workers, 36% reported little or no variety in their jobs, 25%

reported little freedom, 24% reported limited or no use of their ideas and skills on the job, 42% reported no opportunity to learn or increase their skills on the job, and 19% reported that quality of work was not as important as quantity. More than half of the workers stated that almost anyone or a good many people could do their job. This finding indicated to Sheppard and Herrick that most people hold their own jobs in low regard.

It was also found that workers with high task index jobs (see Turner & Lawrence, 1965) reported that their companies emphasized quality of work while workers with low task indexes reported that their employees stressed quantity. Workers who rated their jobs as high in variety, autonomy, and/or responsibility were much more frequently satisfied with their jobs regardless of age than workers in jobs low in these attributes. Workers indicated that the presence of absence of promotional opportunities was one of the most critical job dimensions. This fits in with the high percentage of workers who report that their jobs did not allow them to improve their skills or to learn new skills. Sheppard and Herrick concluded that over 30% of workers were dissatisfied with their jobs.

Quinn and Shepard (1974), in a national probability survey of workers, found few differences from 1969 to 1973. Job factors were grouped into the following four clusters: comfort, financial rewards, resource adequacy, and challenge. Challenge included questions relative to the opportunity the job provided the worker to use his skill or education and how interesting and how varied the job was. Group results indicated that middle age workers who

had a college degree, who were in professional, technical or managerial occupations had the best working conditions as measured by the above four clusters. The poorest conditions were reported by workers under age 21, grade school or less education, blacks, and non-farm laborers. From 1969 to 1973, a sex difference disappeared resulting perhaps from a decrease in quality of work life reported by men and an increase by women. The report contains statistics in response to questions concerning job difficulty, utilization of skills, education on the job, autonomy, and control contained within the job.

Levitan and Johnston (1974), in their review of statistics and surveys of workers, conclude that most workers are reasonably well adjusted to their work and that turnover and labor unrest are less prevalent today. The overall skill level of workers has increased as well as the number of individuals in managerial and professional occupations. The number of unskilled workers is reported to be declining. Levitan and Johnston believe that pay remains the most important salient factor in job satisfaction.

Weaver (1974) reviewed four Gallup Polls from 1963 to 1969 which were based on one survey question asking the respondent to indicate whether they were satisfied or dissatisfied with their work. He concluded from his review that job satisfaction is higher for professional, farm and skilled blue collar workers. He points out a number of other relationships between job satisfaction and demographic correlates.

In a later analysis of data obtained from the National Opinion Research Center of Chicago, Weaver (1975) reported a survey in which

respondents were asked to select the most preferred job characteristic. An analysis of the survey data in terms of dichotomizing the sample into white collar and blue collar did not fully support the contention that white collar workers are interested in intrinsic job factors and blue collar in extrinsic factors.

It is interesting to note that 64% of the white collar and 45% of the blue collar workers choose the intrinsic job factor of work importance as the most important job characteristic.

Quinn, Staines, and McCullough (1974), in summarizing survey data from 1958 to 1973, reported that job factors clustered into five areas: resources, financial rewards, challenge, relations with co-workers, and comfort. They reported that most workers in national samples gave high ratings to the availability of the resources needed to perform well and to the challenge of their jobs and lower ratings to financial rewards and comfort factors. Blue collar workers ranked pay higher than job challenge, and women ranked comfort factors higher. They conclude that "a mixed motivational picture" describes the American worker in terms of his ratings of job factors.

## Job Specialization

Warren (1958), MacKinney, Wernimont and Galitz (1962), and an article in Factory (1963) review the early 1950 and 1960 research literature regarding the effects of job specialization on job satisfaction.

An earlier attitude survey and interview was conducted by Kornhauser and Sharp (1932). They interviewed 200-300 female employees employed as machine operators on a repetitive task. They found no relationship between work attitude scores and intelligence,

age, and marital status. General work attitudes were not related to specific attitudes of monotony and boredom. Work attitude was not related to efficiency ratings. However, the authors reported that in a group of twenty workers, who had comparable work output records that three of the four workers with the negative attitudes were first, second and fourth in production, and the two workers with the most favorable attitudes were near the bottom in production. Since the workers were paid on a flat hourly basis, the negative attitude of high producers may reflect dissatisfaction with the pay scale. Negative job attitudes were slightly related to absenteeism. Boredom and monotony were more closely related to absenteeism. Other findings included a low positive relationship between emotional adjustment and positive attitude and that negative feelings about poor supervision generalized to unrelated matters.

Walker and Marriott (1951) interviewed 976 workers from three groups of factories. Two of the factories were involved in the mass production of automobiles, and the third factory group were metal rolling mills. Attitude surveys indicated that from 59-75% of the men were satisfied or very satisfied with the operations they performed. In the two automobile mass production factories, 35% and 36% of the men complained of boredom in their job. In the rolling mills, only 8% of the workers complained of boredom.

Boredom was more frequent among conveyor workers than nonconveyor workers in the auto factories. Men on conveyor work had lower levels of job satisfaction than men employed in the rolling mills. Satisfaction with work was a function of comparison with other workers and jobs and with previous job experience. Mass production workers

who previously held skilled craft jobs were very dissatisfied.

Individual differences were reported:

Many men liked their work because it was simple, straight-forward, carried no responsibility, or because they were 'used to it'. Others, though they disliked the job, preferred to cling to it rather than change to more interesting jobs. (Walker & Marriott, 1951, p. 191.)

Walker and Marriott concluded that a certain amount of variety, cohesive intact working groups, prestige and status, and adequate physical work conditions were important determinants of work satisfaction.

Kennedy and O'Neill (1958) contrasted the attitudes of auto assembly operators who performed highly routine and repetitive jobs (1-2 minute cycle time) with utility workers who performed a wider variety of these routine tasks. Mean survey scores indicated that assembly operators performing highly repetitive tasks "held no less favorable opinions toward their supervisors and to the work situation than did utility men performing a wide variety of task", (page 375). The attitude scale was a 71 item questionnaire measuring 14 job content areas. Scoring information is not provided, but results are reported by department and by job classification. In two departments where the utility workers' jobs had been expanded and upgraded, a significant difference was found in attitude. These utility workers had more favorable attitudes than assembly workers.

Walker and Guest (1952) reported that the most disliked feature of automation was mechanical pacing. Some evidence has indicated that many workers prefer this disliked feature.

An interview study of 202 assembly workers found that workers preferred smaller tasks (Kilbridge, 1960a). were asked if the work pace and bonus were the same, and if they didn't have to work any harder, would they prefer a line that put out 400 television sets a day (repetitive small job) or a line that produced 200 sets a day (larger job). A majority of the workers preferred the small task (51%), 37% indifferent, and only 12% preferred the larger job. The second interview question asked for preferences in regard to a belt (mechanically paced) or a push line (stationary). The results indicated that 84% of the operators preferred a belt line because it was easier and provided work rhythm; 6% were indifferent to the question, and 10% preferred a push line. It should be noted that 141 of the sample of 200 were females. No sex differences were found in response to the survey questions. Kilbridge feels that this study casts doubts on the theory that assembly line workers are dissatisfied with the repetitiveness of their jobs.

Lodahl (1964) interviewed 50 male auto assembly workers and 29 female operators engaged in electronic assembly. A content analysis of the interviews was factor analyzed. For both plants, three independent factors explained attitude. These factors were affective components (tension, satisfaction with working conditions, satisfaction with company), instrumental components (feelings about one's performance, responsibility, feedback, intrinsic job satisfaction, satisfaction with fellow workers), and job involvement (product involvement, job involvement, and company involvement).

In the auto assembly plant, technological variables yielded two independent factors. The first was variety and included mental agility required, opportunity for interaction, intrinsic job satisfaction, and pay rate. The second technological factor was called the "assembly line syndrome" and involved work difficulty, physical strain, time pressure, quality-quantity conflict, and repetitiveness.

In the electronic plant, one technological factor accounted for all the variance, but the N was too small to draw conclusions.

Lodahl compares his data to Herzberg's two factor theory.

In addition, he concludes that job enlargement and enrichment of auto assembly jobs must include enhancing variety by job enlargement or job rotation and must also involve change of the "assembly line syndrome" by self-pacing, bank building, or working up the line.

Wild (1970), in a study of 2159 female electronic workers and 236 ex-workers, found that 21% of present workers and 36% of ex-workers expressed dissatisfaction with their jobs which were unskilled-rationalized manual jobs. Job dissatisfaction was more prevalent among younger workers, single workers, and workers with less seniority in the company. The actual work itself was the major source of overall job dissatisfaction. The dissatisfied workers described their work as depressing, uninteresting, providing no sense of achievement, making little use of their abilities, and having little variety. Opposite descriptions were obtained for satisfied workers. Both satisfied and dissatisfied current workers ranked the financial need first, then the social need. Dissatisfied former employees placed the need for a personally satisfying job

in first place. It was concluded that job dissatisfaction was positively related to dissatisfaction with the work itself.

In a later analysis of attitudinal data from 2543 female manual workers, it was found that self-actualization was most related to overall job satisfaction. Biographic factors including age, marital status, and length of service influenced the relationship of job factors to overall job attitudes or levels of satisfaction (Wild & Dawson, 1972).

Form (1971, 1973a, 1973b, 1975) interviewed 1092 auto workers in India, Argentina, Italy and the United States. His findings indicated that most automobile workers were satisfied with their work. They did not dwell on the monotony or boredom of their work. In all countries, high skill level and high work control were associated with higher job satisfaction. It was also found that in the more industrialized countries, skilled workers as compared to other workers participated more in work related social systems and in social systems which extended beyond their families and neighborhood (Form, 1973b). Form's data also indicates that anomic scales or scales of alienation should be interpreted on a societal basis rather than as indicators of personal adjustment or maladjustment (Form, 1975).

Shepard, in a series of studies, has concluded that job dissatisfaction is strongly related to functional specialization. Job satisfaction was low among production workers in mechanized settings, higher for monitors, and highest for craftsmen. The degree of job control, freedom, meaning and autonomy, and responsibility were negatively related to functional specialization (Shepard, 1969). He found in a study of oil refinery operators, auto maintenance craftsmen, and assembly line workers a negative correlation between degree of functional specialization and job satisfaction (Shepard, 1970). Later studies have involved office workers and computer programmers (Shepard, 1971) and oil refinery workers and auto production workers (Shepard, 1972).

## Occupational Level

centers and Bugental (1966) interviewed a sample of 692 employed adults representing a cross section of the working population. Subjects were asked to select the three most important job factors from a list of these six factors: pay, good co-workers, interesting work, work allows use of skill or talent, always be sure of having a job, and work gives you a feeling of satisfaction. These factors were divided into three intrinsic and three extrinsic job factors. Results indicated that intrinsic factors were selected by white collar occupations; extrinsic factors were selected by blue collar occupations. No sex differences were found in overall preference for extrinsic versus intrinsic. However, women selected good co-workers more frequently than men, and males selected use of skills and talent more frequently than females.

Friedlander (1965a) studied a large sample of civil service employees (N = 1047 white collar and 421 blue collar). A questionnaire was developed to measure satisfaction with and importance of 14-16 work characteristics. The work characteristics represented three distinct factors: social environment, self-actualization, and recognition through advancement. The results indicated that white collar workers were more concerned with self-actualization, while blue collar workers placed more importance on the social

environment or interpersonal comfort and security of the work environment. Friedlander did not find differences in work values in status levels within the white collar or blue collar occupational levels. He concluded that values are primarily a function of white or blue collar occupational levels and not the status level one has achieved within that occupation.

Armstrong (1971) found in a sample of 200 engineers and 153 unskilled assembly workers differences in the importance of job factors. Engineers rated job content factors (recognition, responsibility, achievement, advancement, and the work itself) as more important, and assembly workers rated context factors (salary, security, status, supervision, etc.) as more important. However, in spite of these differences between occupational levels, content factors made the greatest contribution to overall job satisfaction.

Kahn (1973) reports survey data from over 3000 workers in 16 industries that indicate the higher the occupation, the more satisfied the person. For example, 93% of college professors answered yes to the question if they would choose a similar occupation again. Only 16% of unskilled auto workers would choose the same occupation again.

Sirota (1973a), in a survey of 16,000 manufacturing employees from one company, found that the lower the occupational level the greater the feelings of underutilization. Workers were asked how much of their work could be handled by a person of less experience or training. About 46% of production workers responded a great deal; 30% of plant support workers; 24% of engineers, and 15% of managers.

Kaplan, Tausky, & Bolaria (1969) report that in a study of a large research organization that significant differences were found between scientific personnel and nonprofessional workers. Professional personnel were satisfied with the work itself and opportunities for achievement, advancement, and freedom on the job. Nonprofessional personnel expressed satisfaction with job security, salary, and working conditions.

Another comparison of unskilled and semi-skilled machine operators and skilled craft employees indicated that skilled employees were more concerned about work quality, had greater interest in their work, placed less emphasis on money as a reward, had a higher self-concept, and were more socially active on and off the job (Argyris, 1959).

## Technological Factors

Blauner (1964) contrasted the work content, attitudes, and level of alienation of workers from four different industries representing four different types of technology. The four industries were: (1) printing-craft technology,  $\underline{N} = 115$  workers, (2) textile-machine tending,  $\underline{N} = 400$ , (3) automobile assembly line technology,  $\underline{N} = 180$ , (4) chemical continuous process technology,  $\underline{N} = 78$ . Blauner found that each dimension of alienation including power-lessness, meaninglessness, isolation, and self-estrangement varied according to the type of technology. Alienation is lowest in the printing-craft industry, where the workers' freedom is maximum. Alienation is highest in auto assembly line technology and in the textile industry. The continuous process technology of chemical production has changed the dominant job requirement from skill or

material handling to responsibility. Workers neither see the product or handle it. They monitor complicated controls and the automatic production process. In the chemical companies, automation has actually increased the workers' control of work and added new responsibility to the work.

A study of 1491 Canadian workers from three different industries (printing, automobile, and oil) tested the common finding that the worker is more integrated or less alienated in the oil industry, which is a continuous process technology as compared to the auto industry which is a mass production system (Fullan, 1970). Integration was measured by five aspects: relationship with fellow workers, relationship with first line supervisors, labor management relations, the status structure of the organization, and evaluation of the company. The results indicated that oil workers were more integrated than auto workers, with printers falling in between.

Meissner (1971) reports data from an interview study of 206 blue-collar workers. He found a consistent negative relationship between technical constraints such as machine pacing and spatial confinement, and social interaction on and off the job.

Susman (1972a) studied 26 plants engaged in continuous process production to determine why alienation is reported to be so low in continuous process production as compared to mass production of discrete items. Jobs were classified by type of control (automatic or manual), type of process (batch or nonbatch), and type of industry (glass, cement, electric power, chemical, etc.). A total of 106 jobs in the 26 plants were rated on three indices of alienation which included power, meaning, and norms. In general, the

results indicated that advanced automation per se does not reduce worker alienation. In continuous process jobs, other characteristics of automated jobs have as great an influence on alienation as automation per se. When discrete technology is transformed into continuous process production, the following job characteristics reduce alienation: interdependent work relations and groups, occupational structure based on skill level, and increased opportunities for freedom and variety.

Kirsch and Lengermann (1972) found that self-estrangement in work was related to lack of control over the work process, task specialization, and lack of promotional opportunity. In a survey study of 150 bank employees, 4% of the bank computer personnel, 48% of clerical workers, and 64% of machine operators had high levels of self-estrangement.

Seeman (1971) has reviewed four types of alienation which include self-estrangement, feelings of powerlessness, social isolation, and cultural estrangement. Seeman concluded that the evidence does not support alienation as a one-dimensional factor. The following assumptions concerning alienation are questionable:

(1) the coherence and relationship of various alienated attitudes,
(2) generalization of these attitudes across an individual's life span, (3) the defeating effects of large scale organizations, (4) the liabilities of social isolation, (5) the scope and intensity of work conflict, (6) the centrality of work for one's self image, and (7) the profound frustration of menial repetitive work.

An interview study with workers employed by a large chemical company in England found that technology was related to job attitudes

(Wedderburn & Crompton, 1972). Workers involved in continuous process jobs were more satisfied than those engaged in batch jobs. Tradesmen were more conscious of status than manual workers and expected more from their jobs. The workers as a whole indicated that the best things about working for the company included security and good physical working conditions. The worst aspects were poor management and feelings of regimentation. Attitudes toward supervision varied according to the type of job.

#### Job Attributes

Svetlik, Prien, and Barrett (1964) investigated the relationship between job difficulty and job attitudes on nonunion employees (N = 110). Job difficulty was a summated rating of jobs on 12 factors. The results indicated that as job difficulty increased, employee attitudes were significantly more positive toward the job, management and communication, and opportunity for advancement. Supervisor ratings of effectiveness in terms of job competence was positively related to job difficulty.

Alderfer (1967), in a questionnaire study of 1700 employees of a division of a manufacturing organization, found that as complexity increased, satisfaction with use of skills and ability increased, and satisfaction with respect from superiors decreased. Similar results were found in a job enlargement project. Two explanations were postulated for the decay in worker-supervisor relationships. First, it was thought that the complex jobs required higher levels of interpersonal competence for good relationships. Second, rapid technological change may result in increased tension, career anxiety, and strain between workers and supervisors.

Hinrichs (1968) completed a large scale survey of 1600 employees of a marketing organization. He identified nine factors of satisfaction and found for both male and female nonmanagerial populations that attitudes regarding the nature of work itself and attitudes toward the company appeared to be the most important correlates of overall satisfaction and explained the major attitude variance.

Ronan (1969b, 1970a, 1970b), in a survey study of over 1300 managerial employees, 3600 salaried employees, and 6200 hourly employees, found general agreement in the rating of 68 job characteristics, particularly in the area of the most and least important job characteristics. The nature of the work was found to be an important major determinant of job satisfaction, along with pay and the company. It was found that there was little relationship between satisfaction and work behaviors. Where such relationships were found, the link appeared to be in the area of direct supervision.

Using data from the 1950, 1960, and 1970 census, Brown (1975) classified jobs as discretionary or nondiscretionary based on their code level from the Dictionary of Occupational Titles. A job coded 454 or lower was classified as discretionary, one coded 565 or higher was classified as nondiscretionary. The results indicated that the total number of people employed in jobs with discretion has increased from 1950 to 1970, but the percentage has remained the same. Approximately 55% of classified jobs were judged to be discretionary. More blacks and females are in nondiscretionary jobs. Earning for discretionary work has increased faster than earnings for nondiscretionary work.

Stone and Porter (1975) and Porter and Stone (1973) studied the attitudes of over 500 workers from 16 different craft jobs in a telephone company. The workers completed the Job Descriptive Index as a measure of satisfaction, a measure of organizational commitment, a rating of eight job characteristics, and a self-rated measure of performance motivation.

The results of the first study (Stone & Porter, 1973) indicated that satisfaction with the work itself was highly related to the rated job characteristics of variety, autonomy, friendship opportunities, and prestige. Task identity and feedback were not significantly related to satisfaction with the work itself. The Hulin and Blood (1968) model of urban alienation was not supported as workers in jobs of larger scope did not experience greater dissatisfaction. The sample was from a predominantly urban area and were blue-collar workers.

The main results of the second study (Stone & Porter, 1975) indicated that grouping individuals by job titles or classifications explained 53% of the variability in attitudes, and job characteristic scores were related to the positioning of jobs in the discriminant space. The study supported the positive relationships found by others concerning job scope and workers' attitudes.

Taveggia and Hedley (1974), in a large scale study of 5274 industrial workers from six factories in the United Kingdom, measured perceived work discretion by a questionnaire which consisted of items related to work variety, physical movement relief opportunities, work speed, slack time, attention requirements, and other factors. They also included a measure of work participation discretion

which was concerned with whether an individual would work if he was not required to do so, where he would work, and at what job he would work if given a choice. The major results were that the eight items measuring perceived work discretion fell into two separate clusters—one measuring work movement, the other cluster involved talking to other people and personal thoughts while working. The items measuring work participation discretion were significantly related to local job market conditions. It was found that this variable, work participation discretion, was more significantly related to work satisfaction than perceived work discretion.

Workers in departments with production lines perceived less discretion than workers in nonproduction line departments in the following areas: relief opportunities, physical movement, work speed, slack time, and work variety. Taveggia and Hedley found wide individual differences in workers' perceptions of job discretion for those performing objectively identical jobs.

Aldag and Brief (1975a) studied age differences in relation to job core dimensions and higher order need strength. In two samples of employees ( $\underline{N} = 122$  and  $\underline{N} = 99$ ) from a manufacturing company and a public sector agency, it was found that older workers in one sample exhibited significantly higher general satisfaction and growth satisfaction; but in the second sample, the differences were not significant. No significant age differences were found in perceived autonomy, skill variety, or feedback from the job. Both younger and older workers were more satisfied with higher levels of these task dimensions. In one sample, younger workers responded

very unfavorably to jobs lacking in significance and meaningful output; older workers did not. However, this finding did not cross validate. It should also be noted that in this study, Sample A had an average age of 36 years with a range of 18-64. Sample B consisted of an average age of 41 with a range of 21-64. Results were computed by dichotomizing the samples at the respective age medians which were not reported. Task dimensions were also dichotomized at the median. Other studies which have investigated the relationship of age to job factors and work behavior include Friedlander (1965b, 1966), Iris and Barrett (1972), Stagner (1975), Wild and Dawson (1972), and Wood (1971).

# Mental and Physical Health

The Task Force Report (United States Department of Health, Education, and Welfare, 1973) concluded that although causation has not been established, there are relationships between alcoholism, drug abuse, suicide, violence, crime, mental illness and working conditions.

Reviews of survey data in the area of mental and physical health of workers involve the following references: Quinn, Staines, and McCullough (1974); Survey Research Center (1971); Quinn and Shepard (1974); and Sheppard and Herrick (1972).

Kornhauser (1965) interviewed 655 automobile workers and concluded that job simplification was the cause of poor mental health. In addition, as job level or skill level decreased, mental illness increased. Kornhauser used six criteria of mental health which included anxiety and tension, self-esteem, hostility, sociability, overall satisfaction with life, and anomie.

McWhinney and Adelman (1966) reanalyzed Kornhauser's data and concluded that a large part of the variation in mental health could be explained on the basis of pre-job characteristics and the early life experiences of these workers. Kornhauser (1965) replied that both personal characteristics of the worker and situational job factors are related to mental health but that personal characteristics alone will not explain the poor mental health of auto workers.

Pym (1963) studied frustration and aggression in 310 men working in offices and factories of eight different organizations. He found that factory workers were significantly more frustrated than office workers and that unskilled workers had higher levels of frustration than skilled workers. These differences between occupational groups could not be explained solely on the basis of the work itself as there were antecedent, environmental and social cultural conditions producing frustration and aggression in these workers.

However, unfavorable job attitudes to both intrinsic and social aspects of work correlated highly with frustration.

Frustration was weakly related to aggression as measured by a paper and pencil picture test. It was found that frustration in interpersonal relationships was most likely to produce aggressive responses.

Job attitudes to five intrinsic job aspects and nine social aspects were combined and were related to seven indicators of work frustration. It was found that job attitudes were related significantly to looking for another job ( $\underline{r} = .48$ ), desire to

stir up trouble at work ( $\underline{r}$  = .47), clock watching ( $\underline{r}$  = .31), and feeling depressed with work (r = .30).

In a recent study of United Auto Workers and their spouses  $(\underline{N}=888)$  reported in 1974, it was found that 95% of the workers were satisfied with their jobs, and 71% reported that no part of their work was tiring or upsetting. A measure of general mental health, the MacMillan Index, was used. There was no more evidence of mental illness in auto workers engaged in production line work than in their spouses. Of the workers who were classified as sick, it was found that they more frequently expressed dissatisfaction with their work in terms that it was tiring and upsetting (Siassi, Crocetti, & Spiro, 1974).

Kasl and French (1962) reviewed company medical records for 6000 blue-collar workers. They found that dispensary visits were inversely related to job skill level. Men with low skill level jobs with high perceived monotony and dullness had more dispensary visits.

A later study (Kasl & Cobb, 1964), involving 331 male employees of a research laboratory, did not confirm the inverse relationship between occupational status and dispensary visits. This study found that men on frustrating jobs had more dispensary visits.

French (1973) and Coburn (1975) have concluded from their research studies that incongruence between an individual and his job results in poorer physical and mental health. This incongruence can involve a mismatch between the workers' abilities

and skills, the ability requirements of a job, the complexity of a job, and the preferred level of complexity.

## Job Enrichment

## Definitions

Since 1950, job design to enrich and enlarge jobs has been used by some companies to combat the adverse effects of the traditional scientific management approach that advocated specialization and division of labor.

Conceptual confusion exists regarding the definition of job enrichment, job enlargement, vertical job loading, horizontal loading, and job rotation. Early workers in the field used the term "job enlargement", and this term was defined as follows:

The process of allowing individual workers to determine their own working pace (within limits); to serve as their own inspectors by giving them responsibility for quality control; to repair their own mistakes; to be responsible for their own machine setup and repair and to attain choice of method. (Hulin & Blood, 1968, p. 42.)

Hulin and Blood (1968) use the term "job extension" to refer to situations in which additional jobs or similar elements are added to a job without changing the job intent.

Herzberg (1968) stated that the term "job enlargement" should not be used. He distinguished between horizontal job loading (job enlargement) and vertical job loading (job enrichment) which involves changing the content of the job to add "motivational factors."

Lawler (1969) defines the horizontal job dimension as referring to the number and variety of the operations an individual performs

on the job. The vertical dimension is used to refer to the degree to which the job holder controls the planning and execution of his job and participates in the setting of organization policies.

Reif and Luthans (1972) point out that the differences between job enlargement, job enrichment, job rotation, and job extension may be more semantic than real. Conceptually, they believe that the differences between terms can be made clearer by use of a continuum diagrammed below:

Low (VRG)

Rotation Extension Enlargement Enrichment

Continuum of Job Variety, Responsibility, and Growth (VRG)

A working definition of job enrichment is:

A concern for designing jobs that include a greater variety of work content; require a higher level of knowledge and skill; give the worker more autonomy and responsibility for planning, directing, and controlling his own performance; and provide the opportunity for personal growth and meaningful work experiences. (Luthans & Reif, 1974, p. 31.)

Job enrichment programs have involved a variety of workers at all job levels and a diversity of job changes.

#### Implementation

There are no set guidelines for the initiation, development, or implementation of job redesign projects. Here again, every practitioner uses his own plan--his own techniques. The following represent a few selected approaches.

Herzberg (1968) lists a series of steps for implementing job enrichment. First, he believes that jobs should be selected if the change is not too costly, if attitudes are poor, and motivation will make a difference in performance. The next step involves formulating a list of changes that may enrich jobs. Herzberg recommends eliminating all hygiene factors, horizontal job loading, and generalities. He advocates vertical job loading only. He recommends avoiding direct participation in job redesign decisions by employees whose jobs are involved. In the initial attempt, he states that a controlled experiment should be set up with pre- and post-tests of performance and attitude. He claims that initially there may be a drop in performance in the enriched jobs and that the changes will result in some anxiety and hostility on the part of first-line supervisors.

Herzberg's insistence against worker participation is in opposition to the position of others (Hautaluoma & Gavin, 1975; Swain, 1973) and to research results regarding worker participation in job design changes (Chaney, 1969).

Rush (1971) points out that no clear-cut step-by-step model exists for job redesign. They recommend the following general guidelines:

- 1. Analyze all possibilities throughout the organization.
- Work on a problem by selecting a job or jobs where there
  is a problem in productivity or morale.
- 3. Begin with a pilot project with experimental control.
- 4. Assess employee motivation.
- Communicate to workers the real intent of the proposed changes.
- 6. Develop assessment mechanisms of the effect of job changes.

- 7. Gain the supervisor's support and train supervisors to give up some of the managing aspects.
- 8. Train job incumbents in their enriched tasks.
- 9. Gain union support.
- 10. Build feedback mechanisms into the job.
- 11. Set expectations high.

Gifford (1972) enumerates the following steps in implementing job enrichment: Obtain firm commitment from top management, discuss the program with middle management, and keep them informed; brainstorm and use worker participation to screen ways to enrich jobs, establish time tables, and set up a controlled experiment if possible; maintain effective feedback channels at all stages, introduce first-stage changes (those of least dollar cost and smallest psychological conflict), continue to implement according to stages, and provide maintenance and upkeep as necessary.

Many companies use brainstorming sessions to develop ideas to improve jobs. Sometimes these brainstorming sessions are referred to as "Green Lighting" which consists of open-ended sessions with no restrictions (Travelers Insurance, 1971). During these green lighting sessions, comments regarding the feasibility or practicality of an idea are discouraged as they tend to inhibit a free flow of ideas. After this session, a number of additional meetings are held to weed out impractical and impossible green light ideas. This elimination process is called "Red Lighting."

Sirota and Wolfson (1972a, 1972b) point out a number of obstacles to job enrichment and recommend a four-phase implementation program including diagnosis, top management exposure, the

training program, and job enrichment. Diagnosis involves identification of problem areas, units or jobs by intensive systematic attitude assessment. Top management exposure involves setting up internal job enrichment staffs and units. The training program objective is to give the staff sufficient theoretical and technical background to work as consultants to managers interested in carrying out job enrichment projects in their departments. The job enrichment phase involves diagnosis, work flow analysis, selecting the enrichers, idea generation and screening, implementation strategy, and evaluation strategy.

Walton (1972a, 1972b) describes problems in implementing radical changes in a new plant. In addition, Walton (1975) reviews the lack of diffusion of eight successful job redesign pilot projects. He suggests that the self-limiting effects of successful pilot projects can be overcome by a number of measures including introducing a number of projects at the same time in the same firm, avoiding overexposure and glorification of a particular project, and having top management identify with the project at the initial stage.

Yorks (1973) recommends that job enrichment should be based on a consulting rather than a training model. The job enrichment specialist should not teach job enrichment principles, but he should be actively involved in the projects, and he should work on them on a regular basis to help solve problems. A key man in a line position in the company should be assigned to work closely with the specialist and should be charged with building job enrichment into the department on a permanent basis.

In the area of responsibility for job enrichment, survey results have indicated that in 12 out of 41 companies using a formal approach to job enlargement, the line manager was given responsibility for implementing the program; in 5 companies, the personnel manager; in 4 companies, a staff officer such as the industrial engineer; and in 20 companies, another person, or the question was not answered (Reif & Schoderbek, 1966; Schoderbek & Reif, 1969).

Reif and Tinnell (1973) have developed an evaluation form for selecting jobs with the greatest potential for job enrichment. This scale consists of 18 pairs of statements placed at opposite ends of a five-point scale. Each bipolar pair refers to one of the key determinants of job enrichment potentiality which include the job itself, technology, the workers, and management. An example of an item is:

The Job Itself [Item 5]

The conversion Training and 1/ /2/ /3/ /4/ /5 and one time other costs set-up costs associated with job enrichment involved in job enrichment can are estimated to be recovered in be much greater a reasonable than expected period of time. results.

This evaluation process involves rating the job on the 18 statements and summing the score and then dividing by 18 to arrive at the job enrichment rating. The authors report that a low rating of 1.0 - 1.9 indicates that a job can be enriched and will yield a high return on investment; a rating of 2.0 - 3.9 indicates

a marginal return, and 4.0 - 5.0 indicates that a job should not be enriched. No statistical data on the evaluation form is given, but it is reported that the form has been very useful in selecting jobs for enrichment.

Hackman, Oldham, Janson, and Purdy (1975) enumerate a strategy for job enrichment based on their theory of higher order growth need strenth and the Job Diagnostic Survey. The strategy involves diagnosing the jobs and workers in terms of scores on the Job Diagnostic Survey measuring satisfaction of workers, motivating potential score of the target job, identification of the specific core dimensions of the job, and growth need strength of the employee.

The next step involves determining the actual job changes that are needed to improve the core job dimensions. There are five implementing concepts that relate to different core dimensions. These are combining tasks, forming natural work units, establishing client relationships, vertical loading and opening feedback channels. This implementation approach has four main characteristics: (1) It is based on a psychological theory of work motivation, (2) It emphasizes planning and diagnosis, (3) It provides a set of implementary concepts and rules for selection of job changes, and (4) The strategy has been empirically tested.

Hackman (1974, 1975) believes that the failures in recent job design projects have resulted from problems in implementing these projects. These problems include the following: (1) sometimes the work itself does not actually change; (2) insufficient

attention is given to the impact of the change on the surrounding work systems; (3) rarely is a systematic diagnosis of target jobs undertaken prior to the change; (4) redesign projects are not systematically evaluated; (5) consulting staffs, line managers, and union officials do not obtain adequate information regarding the projects; (6) work redesign projects often are managed by traditional bureaucratic practice. Hackman formulates five recommendations for successful implementation which avoid the above errors and which represent five ingredients of successful job enrichment projects: (1) key individuals attack the difficult problems from the start; (2) diagnosis of change based on a theory of work design is conducted before implementation; (3) specific changes are explicitly discussed and based on diagnosis; Hackman recommends involving workers in the change; (4) contingency plans are prepared ahead of time to deal with problems and opportunities that come up from work redesign; (5) the project is evaluated continuously.

A recent report by Lupton (1975), involving a job redesign project in a manufacturing plant, used a method designed to strike an optimal balance between efficiency and quality of work life. A project team consisting of two social scientists, engineers, and accountants had the task of redesigning a new manufacturing process for a mass-produced article with an output of approximately 1,000 units per week.

The team settled upon six possible alternative designs ranging from a single operator performing the function completely by himself through a completely manned assembly line where the speed would be determined by machines and conveyors.

In order to include the desires of the workers, Turner and Lawrence's five factors of variety, autonomy, responsibility, interaction, and completeness of task were used as the basis for constructing profiles of the job requirements for each of the six alternative manufacturing systems. The resulting profiles for each of the six alternatives could then be compared with the conception of what would be an adequate quality of work life. next step was to use these same five factors to determine job expectancies. Ideally, the workers themselves should have filled out the rating form, but this was not possible in this situation. Instead, senior managers and foremen gave their views on the expectancies of the operators. The project team also rated their expectations on the five factors. In each case, the foremen believed the workers' expectations were lower than those of either the managers or the project teams' observations. Cost considerations ruled out the first two alternatives, and the task was then to reconcile the conflicts between efficient, economic organization and the quality of work life when designing new manufacturing operations. The success of this job design project has not been evaluated as yet.

Other articles pertaining to the implementation of job enrichment and enlargement projects include Davis, Cherns, and Associates (1975b), Ford (1969a), Glaser (1974), Grote (1972), Hautaluoma and Gavin (1975), Maher (1971), Myers (1970), and Taylor (1972).

# Involvement of Business and Industry

As was noted previously, the first job enlargement project was undertaken in 1943 at IBM. Other early projects included

Detroit Edison, Sears and Roebuck Company, an Indian Textile
Mill, a West Coast Manufacturer, and Colonial Insurance (Guest,
1957). Maytag Company and the United States Government also began
early job redesign projects (Goode, 1964).

Reif and Schoderbek (1966) reported that prior to 1955, these job enlargement projects emphasized employee attitudes and were concerned with issues of worker fatigue and boredom. In the late 1950's, industry began to view job enlargement as a technique to increase productivity, cut costs, and increase their profit margin.

In 1966, the first major survey of job enlargement was completed (Reif & Schoderbek, 1966; Schoderbek & Reif, 1969). This data was based on a sample of 276 companies selected at random from a list of 500 of the largest U. S. industries, 50 of the largest insurance companies, 50 of the largest transportation companies, and 50 of the largest utilities. The survey defined job enlargement as increasing the content of a job to include a greater variety of knowledge and skills, a more complete utilization of the important cognitive and motor skills possessed by the worker, and more freedom and responsibility in the performance of the job.

Survey replies were received from 210 of the 276 companies sampled. Of the 210 respondents, 80.5% ( $\underline{N}$  = 169) were found not to be using job enlargement. Among the 41 companies using job enlargement, 21 undertook this action to reduce costs as the prime consideration and to improve employee satisfaction as a dual objective.

Companies felt that the two major advantages of job enlargement were to increase job satisfaction and reduce costs. The major disadvantages encountered in job enlargement were overcoming resistance to change, the inability of some workers to grow with the job, increased training time, and union opposition. In evaluating the success of job enlargement, 10% ( $\underline{N}=4$ ) reported very successful, 37% ( $\underline{N}=15$ ) moderately successful, 29% ( $\underline{N}=12$ ) satisfactory, 0% unsatisfactory, and 24% ( $\underline{N}=10$ ) not ascertained. In their interviews of workers, although some of the comments denoted dissatisfaction with the effects of job enlargement, the great majority of responses were quite favorable.

A report in 1970 estimated that only 40 companies in the United States were involved in job enrichment of blue-collar workers, and typically, these companies were small, non-unionized divisions or sections of larger corporations. The report concluded that there was not any really large scale commitment on the part of the U. S. industry to job enrichment (Gooding, 1970).

In 1974, Luthans and Reif conducted another survey of 300 of the top 1,000 Fortune industrials to determine the current status of job enrichment. Of the 300 companies sampled, 125, or 42%, responded with usable data. The results indicated that only 5 of the 125 companies (4%) had any formal job enrichment program. These five firms were very large companies which could be categorized as high technology industry. A total of 32 companies of the 125 (25%) indicated that they had practiced informal job enrichment.

Formal job enrichment programs involved only 10% of the total number of workers in the five companies. The range of workers involved in formal projects was from 25% to only 30% of workers out of a total workforce of 65,000. Informal programs involved only 3% of the workers.

Most companies were using job enrichment in the production/
operation area and then in functional areas including labor relations, finance and accounting, data-processing, etc. Formal
programs involved two-thirds hourly employees; and in informal
programs, there were equal numbers of hourly and salaried workers
involved. The survey results indicated that the primary reason
given for implementing job enrichment was to improve employee performance and then job satisfaction. Only 3 out of the 5 firms with
formal job enrichment programs had systematically evaluated results.
The majority of companies with informal programs had not evaluated
results. Luthans and Reif concluded that most companies believed
that they had benefited from job enrichment programs but that in
view of the lack of formal evaluation, these beliefs are at the
level of impressions and anecdotal evidence.

Wild and Birchall (1975), in a recent survey of both European and American companies and job design experts engaged in job restructuring (total  $\underline{N}$  = 122), found that operational issues predominate as the major reason for undertaking job redesign. The following table indicates the principal reason for job restructuring exercises.

Reason/Objective	Projects for Blue-Collar Workers (N = 75)	Projects for White-Collar Workers (N = 47)
Systems Output		
(Productivity costs, quality,		
flexibility, etc.)	41%	47%
System Changes (New equipment,		
new plan)	9%	6%
Personnel Problems		
(Turnover, absenteeism)	17%	17%
Concern for Employee (Worker morale, meaningful		
work, reduce monotony)	19%	23-1/2%
Other		
(Supervision)	14%	6-1/2%

They concluded that few organizations

Stated their primary objective in terms of quality of working life or worker satisfaction, although in discussion with those involved, such factors are often cited in terms of an outcome or the background philosophy to exercises. (Wild & Birchall, 1975, p. 17.)

Their survey results led to a hypothesis of a three-stage life cycle model of change. The first stage is characterized by remedial motives of improved quality, reduced turnover and absenteeism, and improved system flexibility. The second stage in the change cycle is motivated by a desire to adjust to broader social, economic, and political issues and stems from organizational change and development. The third and final stage is a combination of Stages 1 and 2.

A recent survey of government units indicated that 187
Federal agencies were involved in 574 specific instances of

"human resource enhancement" (Owen & Croll, 1975). These programs included job enrichment, flexitime, and other changes.

Walton (1975) studied eight organizations which began comprehensive work redesign projects in the 1960's. The eight companies included Corning Glass, General Foods, Alcan, Northern Electric, Shell U. K., Norsk Hydro, Hunsfos' Paper Mill, and Volvo. These companies had a number of factors in common, including the success of these work redesign projects, the tremendous amount of publicity given to these projects and the organizational structure of the companies which included geographically separate units or plants. The results indicated that in four companies (Corning, Northern Electric, Hunsfos, and Norsk Hydro), diffusion of these pilot projects was small or nonexistent. In three companies (General Goods, Shell U. K. and Alcan), spread of the work innovations occurred at a slow, but not sustained, rate. Only at Volvo had the innovations spread impressively throughout the company. Walton examines a number of situational factors to explain why these pilot projects were so limited in expansion.

In summary, the available evidence strongly supports the conclusion of the Survey Research Center that job enrichment and work reform have had little impact on the American work force (Quinn & Shepard, 1974). There are strong indications that the job enrichment, work restructuring, and worker participation movements are far more widespread in Europe and the United Kingdom than in the United States (Rosow, 1974). American auto makers really do not believe that job enrichment can make existing assembly lines more satisfying to the worker or more profitable (Organizational Dynamics, 1973).

# Union Opposition

Levitan and Johnston (1973) report that many production workers and union leaders are distrustful of work reform and job enrichment. It has been inferred that unions oppose job enrichment programs because they want to maintain the management-union dichotomy and adversary position (Gooding, 1970).

Myers (1971) discusses methods of overcoming union opposition to job enrichment. Myers concludes that management programs are bound to be opposed by unions unless the unions are involved in the changes, and the changes are perceived by the union as serving their needs as well as managements.

Reif and Tinnell (1973) report that companies that have had good relationships with their unions have had little union opposition to job enrichment. An example is A T & T.

Blum, Moore and Fairey (1973) examined 110 union contracts and 12,100 clauses and found that clauses pertaining to motivational forces such as job enrichment or human resource development were almost non-existent.

Gomberg (1973) concludes that "the trade unionists have probably done more to eliminate sub-human work by raising wages than all the elaborate schemes of scholars laid end to end", page 16.

Fein (1973) asserted that recent labor disputes in the auto industry could not be attributed to the longing of younger workers for enriched, meaningful jobs but to disputes over work standards.

He also reported that in Europe all of the job design projects were initiated by management. Fein states "there is a sharp difference of opinion between what workers say they want

and what proponents of job enrichment say workers should want (page 79)." Fein concludes that for the most part, workers are satisfied with the nature of their work. Areas of dissatisfaction are their pay, job security and some of the work rules.

Rosow (1974) reports that job enrichment and worker participation projects constitute threats to unions and that they are viewed with great suspicion. However, increasing absenteeism is beginning to worry union leaders, and there are indications that union leaders are beginning to join in to explore job design changes.

Katzell, Yankelovich and others (1975), in a survey of managers ( $\underline{N} = 563$ ) and union leaders ( $\underline{N} = 69$ ), concluded that both groups were skeptical regarding the effects of job redesign and enlargement on productivity and satisfaction. "Bread and Butter issues" were rated more important than job enrichment by union officials.

## Worker's Reactions

Job enrichment programs have been designed to include all workers and have included little consideration of individual differences. Few of the job enrichment field studies have included a consideration of the impact of job change upon the individual worker. The following general articles relate to this issue.

Mackinney, Wernimont and Galitz (1962) reported that the central fact of life in the behavioral sciences is individual differences, and yet job enrichment programs have typically assumed that all people react in exactly the same manner to the same job.

Paul, Robertson and Herzberg (1969) summarize a number of different job enrichment studies at Imperial Chemical Industries and other British companies.

They concluded the following regarding individual reaction to job enrichment:

Individual reaction to job enrichment is as difficult to forecast in terms of attitudes as it is in terms of performance. Those already genuinely interested in their work develop real enthusiasm. Not all people welcome having their jobs enriched, certainly, but so long as the changes are opportunities rather than demands, there is no reason to fear an adverse reaction. If someone prefers things the way they are, he merely keeps them the way they are, by continuing to refer matters to his supervisor, for example. Again, there is nothing lost.

On the other hand, some of the very people whom one might expect to duck their chance seize it with both hands, developing a keenness one would never have anticipated. In attitudes as well as in performance, the existence of individual differences is no bar to investigating the possibilities of job enrichment. (p. 75.)

In a review of 100 or more enrichment projects, Sirota (1973a, 1973b) and Sirota and Wolfson (1972a, 1972b) concluded that applications of job enrichment have been extremely encouraging. Significant changes have been made in the design of work and substantial improvement achieved in terms of both job performance and job satisfaction. However, it was noted that:

Sometime employees are either incapable of doing enriched jobs or unwilling to do them. In no way does job enrichment compensate for incompetence and it is not going to alter a deeply ingrained fear or dislike of responsibility either. Obviously, then job changes need to be tailored to individual capabilities and motivations and indeed sometimes the situation calls for "de-enrichment of jobs". (Sirota & Wolfson, 1972b, p. 14.)

In spite of this concern with the role of individual differences, Sirota and Wolfson concluded that the overwhelming majority of employees are able and eager to handle increased work responsibility. They believe that managers have a strong belief in controls and fragmented work based on a pessimistic view of worker potential and motivation.

Reif and Luthans (1972), in a review article, pointed out three badly neglected areas in job enrichment programs. These included workers who were alienated from the middle-class values that job enrichment programs are based on, the uneven tradeoff between job enrichment and the resulting reduced opportunity and change in workers' social interaction and the negative impact on some workers of feelings of inadequacy and failure. For these workers, low-level competence, security and relative independence are more important than the opportunity for greater responsibility and personal growth in enriched jobs.

Wild (1970) suggested that job enrichment should only be initiated for those workers who report dissatisfaction with their work. A company should inventory job attitudes prior to initiation of a program and determine the extent of employee dissatisfaction. Then if there exists only a small number of disenchanted employees, and depending on the number and variety of jobs available in the company, selective job enrichment may be undertaken; or as an alternative, the company could internally transfer workers to jobs which are more appropriate to their needs.

Fein (1973), an industrial engineer, has stated that the assumptions underlying job enrichment apply to only about 15% of the blue and white collar work populations. In his review of the

job enrichment literature, he concluded that there are few, if any, genuine cases where job enrichment has been applied successfully to a large heterogeneous work force. According to Fein, most enrichment projects have involved either common sense job redesign or have occurred among such a select group of workers that the success of the program was independent of the content. Fein believes that job enrichment has not worked because it has not paid any attention to extrinsic factors - pay, and job security. To increase productivity, he suggests a new approach to job design which balances both intrinsic and extrinsic motivational factors.

Others have pointed out that job enrichment designs based on the assumed inner needs of workers are merely "utopian exercises." Parke and Tausky (1975) concluded that to make job enrichment projects successful, they must be properly designed to include control mechanisms of accountability for performance and material rewards for output that meet or exceed clear cut standards.

Job enrichment programs have been designed to include all workers and have given only superficial consideration to individual differences. Where the role of individual differences in relation to workers' responses to job characteristics is discussed, it is treated principally in the context of attitudinal value orientation. These include only urban-rural differences, alienation, and higher order need satisfaction. These three approaches fail to consider more basic individual differences in ability and cognition.

The role of individual differences in reaction to job characteristics is reported in more depth in Chapter VII of this report.

Review Articles

In recent years, a number of review articles have appeared which either summarize several job design projects or present case studies of the projects. In many instances, these summaries represent the only printed reference to the project.

This section of the report will be presented in chronological order to permit an historical perspective covering the 30-year-old job enrichment-job redesign movement. These review articles do not in all cases contain enough detail to sufficiently evaluate these projects but are excellent sources to provide an overview of the job redesign movement. Articles describing a single job redesign project are not included in this section but will be discussed in Chapter V under case studies and field studies. All job enrichment projects are summarized in Table 3 - Work Restructuring Projects.

Guest (1954) reviewed briefly early projects at IBM and
Detroit Edison. In a later article, Guest (1957) reported on
Mark's (1954) controlled project, work restructuring at an Indian
Textile Mill, Colonial Insurance, and changes in medical nursing
practices.

Davis and Canter (1956) presented two early studies involved in changing job content. These studies included the first controlled experiment on job design in a West Coast industrial plant by Marks (1954) and the reorganization of an Indian Textile Mill (Rice, 1953, 1958).

Goode (1964) briefly noted job enlargement projects, job purification, and job specialization applications in government jobs.

Pelisser (1965) also reviews examples of job enlargement in three federal agencies (Internal Revenue, Social Security Administration, and the Federal Communication Commission).

Davis (1966) reviewed published reports of available results from early projects. These include the first controlled experiment of job rotation and modular assembly (Marks, 1954), bench assembly of laundry equipment (Conant & Kilbridge, 1965), reorganization of an Indian Weaving She 1 (Rice, 1953, 1958), coal mining studies (Trist & Bamforth, 195 and Trist, Higgin, Murray, & Pollock, 1963), centralization of maintenance department and enlarged maintenance jobs in a chemical company (Davis & Werling, 1960), and increased supervisory responsibility and authority in a military aircraft repair operation (Davis & Valfer, 1965, 1966). Davis concluded that these studies "lent support to the general model of responsible autonomous job behavior as a key facet of the individual-organizational-technological relationship in productive organizations" (Davis, 1966, p. 42). Davis includes the following work activities under responsible behavior: completion of a product or service, responsibility for quantity and quality of performance, and recognition of interdependence of work. Autonomous behavior includes self-regulation, self-evaluation, self-adjustment, and worker or group participation in goal setting or performance objectives.

Hulin and Blood (1968) reviewed the literature relating job size to job satisfaction and the job enlargement thesis. Their review indicated that the case for job enlargement had been drastically overstated and overgeneralized. The studies were of two types: those which have used acceptable methodology, control groups, appropriate analysis and statistical designs, and those that contain a number of deviations from acceptable research practices. Hulin and Blood concluded that carefully controlled studies, which were in the minority, have not conclusively supported job enlargement. They stated that reported improvements in quality of worker performance in enlarged jobs should be regarded as a direct result of the technical change in jobs and not as a result of changes in worker motivation or satisfaction. Along these lines, Kilbridge (1960b) also concluded that the cost advantage of enlarged jobs was derived entirely from the reduction in standard work time. This reduction resulted from decreased nonproductive time and balance delay time in enriched and enlarged jobs. Hulin and Blood postulated that the relationship of job size and satisfaction depends on a third variable -- alienation of workers from middle-class norms.

Lawler (1969) reviewed ten early classic job enrichment programs (1950 - 1966) and found that all of them reported higher quality, but only four of the ten reported higher productivity.

Lawler reviewed the effects of vertical and horizontal job enlargement. He found that none of the studies showed that horizontal job enlargement increased either productivity or quality. Horizontal job enlargement may result in increased job

satisfaction. Lawler concluded that the evidence indicated that vertical enlargement was more important than horizontal but that a combination of the two resulted in more consistent improvement in work motivation.

Tuggle (1969) describes three examples of modular assembly in which production was changed from machine conveyor-paced assembly to modular assembly by one or a group of workers. Advantages of modular assembly are improved quality, greater flexibility, greater ease in tracing back rejects, and greater ease in identifying workers who need training. Disadvantages include costs of duplicate tools, increased training, increased floor space, and technological limitations of product size and character.

Ford (1969a), in his review of over 20 field studies at A T & T, reported reduced turnover and absenteeism, improved satisfaction, and in some cases, increased production. Myers (1966), in his review of programs at Texas Instruments to allow employees to plan and control their work, reported on the success of these programs in terms of improved attitudes, increased productivity, and reduced costs.

Foulkes (1969) reviews four different programs at four different companies. These were a job rotation program at Polaroid, a job enlargement program at Texas Instruments, a vertical job loading project at A T & T, and a work simplification program at H. B. Hood. All of the programs were reported to be successful.

Hill (1971) reviews Shell U. K., Limited programs which include productivity agreements, job enrichment, more flexible organizational structure, and management by objectives.

Paul and Robertson (1970) also report that job enrichment projects at Imperial Chemical Industries were extremely successful.

Anderson (1970) compared and contrasted job enrichment programs in ten companies. These companies were divided into four groups: service (A T & T and American Airlines), heavy assembly (Chrysler, IBM, and Maytag), electronics and light assembly (Corning Glass, Texas Instruments, and Non Linear Systems), and processing (Polaroid, and Proctor and Gamble). Anderson describes the job changes and then indicates the obstacles to redesign for each group of companies. He concludes that more research is needed to build a full model of job enrichment. He believes that the technology determines the job redesign measure or change.

Rush (1971) presents seven case studies of job design including Arapahoe Chemicals, Texas Instruments, Internal Revenue Service, Weyerhauser Company, Valley National Bank, PPG Industries, and Montsanto Company. Rush concluded that although few companies have actually implemented job design projects, a few experimental projects and pilot projects are particularly promising in increasing worker motivation which supposedly leads to higher productivity.

Maher (1971) has edited a book which consists of chapters written by managers, consultants, and professors. Projects at Texas Instrument, IBM, Detroit Edison, Western Union, and A T & T are included. The chapters range from theoretical and critical

issues (motivation, individual differences, experimental simulation studies) to case studies.

Taylor (1972) presents nine European and English case studies involving job enrichment. The companies include, among others, Shell U. K., Volkswagen, and Volvo. The treatment of the cases attempts to bridge the gap between research and application. The title of the book, Not for Bread Alone: An Application of Job Enrichment, describes the approach and flavor of the review. All of the cases are reported to be unqualified successes.

Job redesign in Europe has been reported in the U. S.

Press, but detailed descriptions are not readily available.

Organizational Dynamics (1973) described, evaluated, and compared three job redesign projects at three European companies: Philips,

N. V., Saab-Scania, and Volvo. They concluded that none of the companies have lost economically from abandoning machine-paced assembly lines. The only gains in production occurred at Philips.

Quality, turnover, and attendance improved at Volvo, but there was no measurable effect on production. The evidence for the impact of these bold redesign projects is anecdotal.

A separate earlier summary of work restructuring projects at N. V. Philips indicated that job enlargement resulted in some improvement in quality, productivity, and flexibility. Job rotation involved disadvantages of longer training time but allowed for greater flexibility and mutual assistance between workers. Job enrichment yielded increased productivity (Philips, 1968).

A review of 34 enrichment projects is included in the Work in America Task Force Report (U. S. Department of Health, Education, and Welfare, 1973). These projects are tabled and, in addition, titles of 39 papers commissioned for future research are included.

Swain (1973) reviews a number of management approaches to cope with dehumanized jobs, including discharging dissident employees, inaugurating motivational zero-defect projects, providing higher pay, selecting workers with limited mental ability, using worker participation in job design, and creating vertical job enrichment. Swain advocates the proper combination of selection and training of workers, horizontal and vertical job enrichment, and worker participation.

Sirota and Wolfson (1972a, 1972b) and Sirota (1973a, 1973b) summarize cases of job enrichment at Company X, including job rotation, modular assembly, giving workers responsibility for maintenance and inspection, and giving clerks a complete unit of work. They conclude that in 100 enrichment projects, the results were extremely encouraging with both increased job performance and job satisfaction.

Fein (1974) critically evaluates job enrichment projects at General Goods, Proctor and Gamble, Texas Instruments, Polaroid, A T & T, and European experiments in industrial democracy. Fein points to the following constraints in the applicability of job enrichment: technology, cost, low skilled jobs, workers who do not seek fulfillment in work, and contrasting employer-employee goals. Fein points out that workers will not benefit from enrich-

ment programs that increase productivity as they may work themselves out of a job or lose overtime pay. Fein points to a more balanced approach to worker motivation which includes natural selection or job choice on the part of the worker and employers, increased pay to compensate for poor working conditions, job security, and removal of restrictive work rules. Fein concludes that "the most effective productivity results will be obtained when management creates conditions which workers perceive as beneficial to them" (p. 86). He believes that management should leave to workers the final choice regarding what work they find satisfying.

Sandler (1974) has advocated a similar cafeteria approach to job redesign in which employees select from a number of rewards or changes those that he desires and that are appropriate to his individual situation.

Glaser (1974) reports on nine case histories which indicate that job enrichment has resulted not only in the improvement of the quality of work life but also in improving productivity. The case histories include Kaiser Steel, A T & T, Tavistock Institutes, coal mining studies, Donnelly-Mirrors, General Foods, Volvo, and others. In addition, 17 or more additional case histories and special reports are noted. Glaser is generally positive in his review; and although he acknowledges potential pitfalls and problems in job redesign, he attributes these to problems in implementation of these projects.

Davis, Cherns, and Associates (1975b) present 15 case studies involving changes in worker participation and relationships, changes

in organizational structure, and changes in the design of jobs. The four cases of job redesign are all based on the assumption that improving the content of jobs will enhance organizational effectiveness and the quality of life for the worker. The authors view the job enrichment movement in the U. S. as a turning point on the part of the U. S. managers to humanize the work place. However, they note that the primary objective of the four job design projects were organizational goals rather than the quality of work life.

Dickson (1975) reports on profit sharing plans and work restructuring at American Velvet, Donnelly Mirrors, Lincoln Electric, Motorola, Lockheed, and Ralston Purina Company. A failure of job redesign at Non-Linear Systems is noted. Statistics on profit sharing plans report in 1972 that some nine million American workers were engaged in over 122,942 plans. Dickson concludes that job redesign failures are few and that job redesign holds great promise for the future.

Katzell, Yankelovich, and others (1975) reviewed 14 studies that met their stated methodological criteria. Five of the studies were correlational and nine entailed job redesign. The methodological criteria and the basis of selection of the studies were vague. Ten of the 14 studies showed improved attitudes in terms of motivation and job satisfaction. Eight of the studies showed increased productivity, and six of the studies showed decreased turnover or absenteeism. On the negative side of the coin, three of the studies did not find improved attitudes or performance. One study found improved attitudes but not improved

performance. The clearest support for job enrichment came from correlational studies. The authors concluded from these inconsistencies that job enrichment was not regularly associated with significantly better job attitudes or performance.

Levitan and Johnston (1973, 1975) briefly note job enrichment projects at A T & T, Xerox, Bankers Trust, Donnelly Mirrors, Motorola, Corning Glass, Maytag, and General Foods. All of the projects are success stories and "may be the product of advocates reporting positive results" (p. 34). Levitan and Johnston point to the following gaps in the advocates case: successes of companies not involve: in job design, failures not reported, lack of experimental controls, novelty effect wears out, capital investment required to alter production, decrease in the number of repetitive jobs, and some jobs cannot be changed. In spite of these gaps, Levitan and Johnston point to the positive effects of job reform for some workers in some jobs. They also indicate that job reform should be worker, rather than manager-consultant, based.

Srivastva, Salipante, Cummings, Notz, Bigelow, and Waters (1975) reviewed 27 studies which involved job restructuring.

These studies involved assembly line work (8 studies), clerical work (5 studies), supervisors (3 studies), keypunching (2 studies), production processes (2 studies), and 7 miscellaneous (e.g., lab technicians, telephone operators). Over 80% of the studies involved female workers, and the studies were equally divided between white and blue collar workers. The job changes most

frequently involved the autonomy-discretion dimension (25 out of 27 studies), variety (21 out of 27 studies), and information feedback (12 out of 27 studies). The results were highly positive in terms of improved attitudes, productivity, quality, costs, and measures of withdrawal. The authors point to "various threats to the validity of these results" (p. 118). In addition, the criteria of selection of the studies is not clearly stated.

Wild (1975), in his book which examines in detail mass production of discrete items, includes in tabular form 96 examples of job restructuring. Approximately one-half of the companies involved were U. S. firms; the other half were located in the United Kingdom or Europe. He organizes these changes by the following topics: rearrangement or replacement of assembly line work (34 cases), workers given additional responsibility, usually for inspection (14 cases), rotation of jobs (8 cases), responsibility for additional and different types of work (5 cases), control of work speed (1 case), self organization (14 cases). Companies listed 32 reasons for instituting work changes. These included economic reasons (N = 7), personnel problems (N = 12), quality of output (N = 5), and other (N = 8). These results are similar to other surveys (Reif & Schoderbek, 1966). Wild reports that the benefits resulting from these changes include greater productivity, improved quality, fewer grievances, better absenteeism and turnover records, and lower costs. In some cases, the results were quantified; in others, they were not. Wild also notes that few cases of failures or work restructuring projects which were terminated are included or reported. Problems in work restructuring

involve resistance to change by superviso not reflected in payment systems, inadequ change, and resistance to change by worke

Wild, in addition to listing 96 exa includes 12 brief case descriptions invol assembly, television, and typewriter asse include good diagrams of assembly areas a outs. He also summarizes 45 published wo

Wild concludes that there will cont mass production systems as these systems technically desirable. Work restructuring possible within this production system. I will not provide substantial benefits. Examique designs and development.

Wild postulates three principles for redesign. First, jobs should provide closs between tasks. Pacing effects and constrated second, work organization should be based autonomous units of groups of workers who Third, provisions should be made for inforgoal setting, feedback, and performance me

In addition to these reviews, the posterior media have reported on job enrichment projecterms as innovations with great promise.

Clude: <u>business Week</u> (1972a, 1972b), <u>Ecot</u> (1970), Henderson (1970), Herzberg (1971), McManus (1956), Norcross (1974a, 1974b), 1

Northrup (1974), <u>U. S. News and World</u>
Vinocur (1972), Wharton (1954).

Evaluation of Job Enrichment

These review articles and survement represents a bold attempt to imply a collection of articles written by enthusiasts offered bright promises a future (Ford, 1969a, 1969b; Goode, 1954; Herzberg, 1968; Lodahl, 1964; Robertson, & Herzberg, 1969; Roche & 1973a, 1973b; Sirota & Wolfson, 1972a, 1950; Walter, 1972; Walton, 1972a, 1950; Walter, 1972; Walton, 1972a, 1969; Roche & 1973a, 1973b; Sirota & Wolfson, 1972a, 1950; Walter, 1972; Walton, 1972a, 19750; Walter, 1972; Walton, 1972a, 19750;

This promise and these predict
With the recent recession (1975), jol
same "hard times" as the American wo
(1974, 1975) focus upon a disenchanta

Hackman (1974, 1975) believes the "wunderkind" of organizational so its promise and appeal. More and most admitting that their work redesign postuling in substantially changing work of

Recently Blacker and Brown have through which new management concepts passes. The five phases are as followed idea, (2) firms and consultants adopted key findings and omit the limitations saturated, the idea is changed and macademics begin to question the idea

(5) the idea is dropped in favor of a new one. Blacker and Brown have the impression that the job enrichment idea is well along into Stages 4 and 5. They predict a disenchantment with the concept of job redesign.

In conclusion these survey and review articles on job enrichment seem to support Blacker and Brown's conclusion.

### Summary Statements

- (1) General surveys indicate that from 15-20% of the workforce is dissatisfied. The principle source of work dissatisfaction
  is work specialization and decreased work autonomy. Dissatisfaction is related to occupational level, age, education, race,
  sex, and other variables.
- (2) A mixed motivational picture describes the American worker. Blue-collar workers value pay and security factors; white-collar workers value job challenge and the work itself.
- (3) Research evidence indicates that job attitudes are not directly related to productivity but may be related to turn-over, absenteeism, and indices of physical and mental health.
- (4) Job enrichment represents a 20-30 year effort to improve the content of work and has involved a variety of workers from operatives and clerks to research scientists.
- (5) Job enrichment changes are diverse and include establishing autonomous work groups, complete modules of work, increased worker authority and responsibility for work schedules, setup, method, quality control and maintenance functions, reduction of supervision, job rotation, increased feedback, and reduction of work control and constraints.

- (6) There are no set guidelines for initiation, development, or implementation of job redesign projects.
- (7) Job enrichment projects, although well publicized, involve only about 40 companies in the United States and a minute percentage of the total work force.
- (8) Job enrichment projects have generally indicated improved quality, improved work attitudes, and in some cases increased productivity. Labor costs are decreased by reduction of the workforce (e.g., elimination of quality inspectors).
- (9) Pilot projects have not diffused throughout companies, and there is a growing disenchantment with job enrichment.
- (10) Europe and the United Kingdom are more advanced in work redesign than the United States.
- (11) Job enrichment has not had a significant impact on the quality of work life of Americans.

#### CHAPTER V

#### FIELD AND CASE STUDIES

This chapter will present selected case and field studies. The studies are divided into a number of convenient subtopics. First, we will review studies of work environments and jobs that do not involve change. These studies are descriptive of current practices in industry involving assembly line production, work rate, task variety, work productivity, and the general topic of boredom and monotony. Next, are those studies involving technological change which typically has resulted from automation. This section will include a variety of studies from the coal mines to the computerized office environment and includes a few studies of voluntary job changes, including job transfers, job turnovers, and absenteeism. The next section involves studies which focus on congruence models of job design.

The last section of the chapter presents a selection of field and case studies of job enrichment, enlargement, and work restructuring projects. The studies were selected for narrative review to give a broad perspective of the diversity of these projects in terms of the type of industry, type of worker involved, nature of the job redesign or change, experimental design, and other factors.

# Studies of Work Environments and Jobs

#### Assembly Lines

Prior to instituting a number of job design changes at N. V. Phillips, an extensive study was made of assembly line production of television receivers (Van Beek, 1964). The organization of

the assembly line was studied by observation, experimental manipulation, and Monte Carlo simulations to determine its relationship to three variables: output, quality, and morale.

The findings can be summarized as follows: (1) waiting times based on a lack of material and balancing and system losses are smaller in shorter lines than longer lines, (2) the loss percentage in a line without buffer stock is about four times as great as a line that provides this buffer stock, and (3) the shortest waiting times are found in the shortest lines with intervening space between the work places.

In the area of quality of production, it was found that fast and slow workers made more errors as well as workers who vary their speed. Therefore, an even tempo or work flow is necessary to insure quality. In the area of morale, it was found that the small group with buffer stock between work places had the best morale. The authors concluded that for this type of assembly work, the small work group—short assembly line with buffer stock—would yield optimal output, quality, and morale.

Chase (1975) reviews assembly line research and proposes some general guidelines for the selection and use of different types of assembly lines. Chase advocates short lines of less than ten people, if possible. Mixed product lines should be avoided as several one-product lines are easier to manage than mixed ones. Rigid pacing of lines should be avoided by either providing on-line inventories or banks. The worker or the group should control the work pace and determine who should perform which task. This can humanize assembly line production; and if properly done, without decreasing production. Chase believes

that the line balancing problems will be alleviated by short, single product lines. He also points to the role of individual differences in assembly line work. He states that achievement oriented, emotionally labile, extroverted, restless individuals, who may be dissatisfied with their home and personal life, are particularly prone to dissatisfaction with repetitive assembly line jobs. Chase recommends the use of selection techniques to identify these workers. In conclusion, Chase believes that the basic job design decision is not whether to use an assembly line, but which type of line is appropriate.

Wild (1975) examines present practices, current trends, and developments in the mass production of discrete items such as motor vehicles or domestic appliances. His review includes the dual criteria of the operational efficiency of the production system and the behavioral or human aspects.

#### Work Pace or Rate

Turner (1955), in his studies of two auto assembly lines, concluded that the two most important job characteristics were mechanical pacing and repetitive work. These were important sources of dissatisfaction because they resulted in feelings of pressure and impersonality. There are three methods used by foremen to counteract mechanical pacing pressure, which include the recognition and allowance for differences between workers in work capacity and pace, trusting workers' willingness to work, and refraining from adding pressure to the already present pressure of the line. Successful foremen also counteract the repetitiveness of the work by permitting job rotation, delegating

responsibility to workers, establishing good relations with each worker, and encouraging group cohesion.

Belbin and Stammers (1972) report on a study of 300 semiskilled and skilled operators in an interior and exterior trim
department of an auto assembly plant. Most of the detailed
observations involved 60 to 70 operators. These operators used
pneumatic hand tools and were free to move up and down the line
within a limited area. They found that most operators were
able to work comfortably within their allotted time cycle; and
that on day shifts, there was a tendency to work ahead and take
informal breaks. Stress on the line emerged from three sources:
(1) operator interference or someone falling behind and the
work piling up, (2) fluctuation in the quality of material, and
(3) line not staffed or manned with enough people due to absenteeism
or other factors such as skill level of the workers.

The reaction to this pacing stress can involve a temporary strike or walkout, unauthorized line stoppages, voluntary transfer or turnover. It was found that turnover was 20% among workers of age 40 or late 30's. Workers of ages 35 to 40 were found to dislike the work more than other age groups. It is inferred that at age 40, men feel the harmful effects of the stress of the line and paced production. Belbin and Stammers recommend the following measures to counteract pacing stress: off-track training for new workers, retraining of older workers, and formal rest breaks and reliefs for operators.

Konz and Dickey (1969), in a series of experiments, found that error rates and assembly time can be minimized if the worker

is trained using a pictorial approach in which an operator can match a picture with the assembly to be built. A slide booklet approach to assembly line training had the highest cost/benefit ratio.

Smith and Lem (1955), in their observation study of nine female machine operators engaged in light, repetitive work, found that the most frequent voluntary work stops occurred for large lot sizes (3100 pieces); the least frequent, for small lots (310 pieces). The average time worked between stops was greatest for small lots and shortest for large lots. There were no changes in production rate as a result of lot or batch size. It should be noted that the normal lot or batch size was 3100 pieces, which required four hours to complete. Most workers, after the experiment, preferred the normal lot or medium-sized lots (620 pieces). The dislike of small lots was explained on the basis that in the past, small lot production involved a number of special problems. Smith and Lem report that the workers and foremen may not have preferred the small lots due to resistance to change.

Turner and Miclette (1962) interviewed and observed 115

female assembly operators involved in the production of a high

quality electronic product. The typical job cycle for each

worker was one minute or less, and the work consisted of attaching

together small delicate parts. Monotony or boredom was expressed

by only about 20% of the workers, and most workers expressed

satisfaction with the pull or traction of their work. Baldamus

(1961) postulated that traction is a feeling of being pulled along

by a motion inherent in an activity and that this experience is pleasant, as it is associated with feelings of reduced physical effort.

Turner and Miclette described four types of traction including object traction (completion of a unit of work), batch traction (number of objects or units produced), line traction (being pleasurably pushed along by the pace), and general production traction (commitment to departmental productivity and quality goals).

This pleasant experience from object, batch, line, and general traction can become negative or a source of dissatisfaction if the job pace is such that the worker feels a sense of being pushed by excessive production standards or the speed of mechanical conveyors. In addition, interruptions are a source of irritation and are usually caused by problems with incoming materials or equipment and interruptions from outsiders.

Wollack (1969) investigated the effects of work rate upon job satisfaction. Forty workers were hired to perform an assembly or inspection task. After establishing a base line of the workers' preferred rate of work, the subject was assigned to a compulsory work rate above, below, or equal to his preferred rate. The hypothesis that an inverted U shape relationship would be found between actual work rate discrepancies and job satisfaction was not confirmed. However, perceived work rates above the normal rate were associated with fatigue, and perceived work rates below the normal rate were associated with boredom.

However, perceived work rate was only moderately related with actual work rates.

Smith, M. C. (1974) compared three different measures of work speed. Subjects who were electronic assemblers ( $\underline{N}=58$ ) or office workers ( $\underline{N}=25$ ) were given tasks to perform. They were asked how long the task would take (goal set). They were then timed at the task (goal attainment); and after they completed the task, they were asked how long the task had taken (goal estimate). The three measures obtained from clerical workers were then correlated with their speed of writing. The results indicated that goal estimates of how quickly people estimated they performed on a task was related to actual speed on a task at which they are proficient. The other measures, goal set and goal attainment, were not related to actual speed of writing.

Leamon (1974) studied the work performance of seven experienced female operators performing a repetitive hand packing task under three knowledge of result treatment conditions. The operators were studied for 40 days. For the first ten days, no knowledge of results was provided; for the next 20 days, knowledge of results was presented every one-half hour; and for the last ten days, knowledge of results was discontinued. The results indicated that knowledge of results improved performance compared to no knowledge of results and that the level was higher for the withdrawn knowledge of results period than for the 20-day knowledge of results in terms of the effect due to motivational or information factors. He concludes that a worker utilizes

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knowledge of results information to maintain, or change his work pace and methods. The amount of change may be determined by the motivational level of the workers. However, there is nothing intrinsically motivating or inherent in knowledge of results per se, as information seems to be the critical variable.

Laboratory research on speed, pace, or tempo has concluded that there is not a general factor of tempo that applies to all activities, and the use of one test to determine speed is unsatisfactory (Rimoldi, 1951). Clusters of speed have been identified for cognition, perception, and reaction time or motor performance. Each individual tends to adopt a certain speed or tempo for a particular activity, and this best defines his "personal tempo."

Smoll (1975a, 1975b) also found individual differences in a laboratory study of repetitive movements. He found that subjects who performed at faster tempos were more consistent in response (lower within subject variance) than were those subjects performing at slower tempos.

#### Unit of Work

As early as 1931, Harding commented negatively on the subdivision of work. He observed two inexperienced workers soldering wires for three weeks and compared a large unit of work (8-11 wires, 22-26 joints) with a small unit of work (2-3 wires). The results indicated that with a small unit of work, output reached its maximum early in the week and then declined. For the larger unit of work, output improved throughout the week. Total errors were higher in the larger unit of work (.34% faults in large unit and .34% faults in small units). However, with the larger unit of work, there was steady improvement in quality. Workers preferred the larger unit of work. Harding concluded:

The theory held widely in assembly shops staffed with low paid workers that the simpler the operation can be made, the fewer the mistakes that will occur is true only within limits. To a worker of average ability, extreme simplification of the work conduces to loss of interest, absent-mindedness, and increased susceptibility to distraction. (Harding, 1931, p. 264.)

In a series of field experiments and observational-type analyses, Cox and Sharp (1951) have investigated the effects of the unit of work in terms of work cycle and batch size on productivity and job satisfaction. They have found that in the production of small objects (e.g., a light bulb), with a unit or work cycle of 30 seconds or less, batch size should be cut from a one-half day supply to batches lasting from one to one and a half hours. Small batches are preferred by learners and hourly workers. Piece rate workers are not affected by batch size.

In the area of unit work cycle, it is recommended that longer work cycles with buffer stock are desirable to balance operations between workers. New workers prefer a short work cycle. However, when they master a job or task, they desire longer cycles. Cox and Sharp recommended, as early as 1951, modular assembly of products with cost comparison to assembly line production. However, they also point out that satisfaction is gained by many workers from supposedly repetitive jobs, especially when the individual has a certain rhythm and is not

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forced to think or concentrate very deeply about the task and his mind is allowed to daydream or wander. There seems to be a certain satisfaction in maintaining a rhythm and seeing progress in the work, and interruptions of even a short duration seem to be dissatisfying to some operators.

They note that in many repetitive jobs, delays in production due to mechanical failures or faulty materials are extremely disruptive to production and morale.

In a later article, Cox (1970) points out some of the problems involved in conducting "shop floor studies." These include problems of criteria, controls, and apparatus. In addition, real life problems kept contaminating the data, including absenteeism, changes in piece-rate systems halfway through the experiment, union problems, and enthusiastic workers who aimed to please the experimenter.

Hill and Thickett (1966) studied the milling section of a machine shop to determine the effect of batch size, cycle time, and setting time on productivity. The section contained 16 experienced skilled millers. Data was obtained from weekly work sheets. The criterion of productivity was a time measure. The findings generally pointed to the conclusion that the longer the cycle time or setting time, the higher the productivity in terms of percentage of time saved. Batch size was not related to productivity. The data did support the workers' complaint that they lost time and bonus money on "on-off jobs" as compared to batch jobs.

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### Task Variety

Task variety is an elusive concept that is difficult to measure and to conceptualize. However, many investigators feel that it may be critical to job performance.

Kerr and Keil (1963) investigated the effects of job variety on time drag using a sample of 47 hourly employees of a small manufacturing company. The workers were told that the shop clocks were deliberately set slower or faster than accurate time. In reality, the shop clocks were accurate. Employees estimated how fast or slow the clocks were and also rated their work in terms of an interest-boring dimension. Overestimation of time was greater in jobs with variety and in long-cycle jobs as compared to short-cycle jobs. Overestimation was greater if a worker's present job was less repetitive than his previous job.

Kaufman (1965) investigated computer automation and its effect on job satisfaction. According to Kaufman, the major task of a worker within an automated system is to monitor the operation, receive information, and to carry out any control operations required on the basis of the information received. Kaufman tested the hypothesis that the more time a worker spent in monitoring automated systems, the less would be his job satisfaction. The sample consisted of 45 young male computer console operators from 18 large electronic data processing installations. A correlation of -.44 ( $p \le .005$ ) was found between job satisfaction as measured by the Brayfield and Rothe Index and percentage of time spent at monitoring and control tasks as reported by the worker. In addition, the correlation between general job satis-

faction and boredom was -.78 ( $\underline{p} \leq .005$ ). It should be noted that boredom was measured by one question of the Brayfield Rothe Index. The correlation between boredom and the length of time spent at monitoring and control tasks was +.33 ( $\underline{p} \leq .05$ ).

Specific dimensions of job satisfaction were measured using the Minnesota Satisfaction Questionnaire. Achievement and variety were significantly related to general satisfaction. Operators who indicated satisfaction with achievement reported spending less time at monitoring and control tasks. Kaufman concludes that programming and maintenance functions should be added to reduce the time spent at monitoring and control.

An interview and observation study of 204 day shift employees at a community hospital investigated two determinants of work variety (mechanization and management control) (Bell, 1966). The results indicated a positive relationship between the number of different tasks a worker performed and the discretion level of a job which included decision making on the part of the worker on whether to perform a task, how to complete the task, and the order of completing tasks. The authors concluded that work variety was higher in high discretion level jobs that contained a number of different tasks.

In addition, span of attention, which is the number of different jobs or tasks a supervisor is responsible for, was positively related to the number of different tasks a supervisor performed. Bell believes that repetitive, highly predictable work diminishes discretion and increases direct supervision, therefore resulting in low levels of variety. On the other hand,

when work is more varied and unpredictable, a worker can use discretion, which in turn increases task variety.

In a series of studies, Hill (1969) has investigated the relationship of perceived work variety to entropy measures of variety. A quadratic function was found to describe the relationship between perceived work variety and entropy measures for one group of workers (7 out of 10 individuals). In three individual cases, a linear relationship was found. Variety, as measured by entropy, had no effect on the production bonus earned by 10 operators. The author speculates that variety may operate as a suppressor variable like intelligence. For example, intelligence alone has not been found to be related to feelings of monotony, but combined with other factors, it operated as a suppressor variable in multiple regression analysis. Variety combined with other factors, such as job involvement or task difficulty, may act in a similar manner.

Dickson (1973) used semi-structured interviews to investigate work variety in four shop floor work situations. These included an auto assembly engine plant, a butcher's line, a packing line, and a cookhouse in a meat factory.

In the auto engine plant, the assembly station times were 1-1/2 minutes in length during which a number of operations ranging from 1 to 16 would be performed. Variety in work was provided to some extent by the different operations at each station and by rotation between the various stations. No conclusions could be reached regarding the effect of the number of operations on job variety, and the workers did not show preferences for

any particular operations or for rotation between these stations.

Rest pauses were not perceived by workers as providing variety in the work.

In the meat factory, there were five lines, each containing 12 butchers who worked on removing bone and fat from pigs' legs. Each operation required 1-1/2 minutes in which the leg is trimmed and the knife resharpened. A fixed daily quota is set for each line, but workers are allowed to determine work and rest periods. The men established consistent time patterns for rest, cleaning, and meat cutting activities which were followed every day. The butchers reported that the job provided no variety and that batches of 45 to 60 minutes duration were optimal. Rotation to another line was not viewed as increasing variety.

In the packing line, variety was provided by packaging one of 18 different kinds of meat. However, it was easier for workers to achieve their daily bonus payment if they packed only one kind of meat all day long.

Workers ranked eight different workloads in terms of their preferred level of variety. The investigators then determined the variety level of each workload by four measures (number of different meat products packed in a day, number of changes of meat products in a day, the entropy of the number of different meat products, and the entropy of the changes in a day). The results indicated that there was an inverse relationship between workers' preferences and the four physical measures of job variety. Variety in work was not as important as earning a bonus. Workers preferred tasks of low variety in which it was easy to earn a bonus.

In the cooking house, a curvilinear relationship was found between workers' preferences and four physical measures of job variety. This result was a function that one job was the most preferred as it involved more autonomy to the worker.

By examining these different work situation, concise definitions of work units were formulated. An operation was defined as a unit of work of less than 1-1/2 minutes; a task was a unit of work ranging from 1-1/2 minutes to 1 hour; a batch was a unit of work ranging from 1 hour to 2 days, and a change of job occurred after two days.

Batches were dominant factors in variety, and changes of task were more important in providing variety than the actual number of tasks performed in a given time. Discretion over work pace enhanced variety by allowing the worker to control batch size, rest pauses, and other variables. Dickson concluded that: "Job rotation and job enlargement schemes which concentrate on altering jobs at the batch level should be more successful than those that alter jobs at the level of operations and tasks and attempt to rotate jobs at weekly or monthly intervals." (Dickson, 1973, p. 732.)

# Boredom-Monotony

Everyone assumes that boredom and monotony are the natural consequences of work specialization and simplification. This assumption fails to incorporate the wide range of individual differences and the fact that boredom and monotony are present in complex occupations at the higher end of the occupational hierarchy.

Warren (1958) distinguishes between monotony and boredom.

Monotony is defined as sameness or the lack of variety. Boredom is a state of mind involving weariness, fatigue, disinterest, and dislike. Sometimes monotony produces boredom but not always. Productivity, work efficiency, job satisfaction, and mental and physical well being suffer as a consequence of boredom—not merely as a result of repetition or monotony. (p. 436.)

Smith (1953) observed 16 female power sewing machine operators and found subjective reports of boredom were not accompanied by a depression in the production output curve. She found fairly stable individual differences in the speed of working, number of rest pauses, and amount of talking behavior. These observed differences were not related to subjective reports of boredom or monotony. However, each worker had a concept of the amount of work she should complete each day. At the end of the work day, if she had completed the work, the operator reduced her speed or stopped working completely. If she was behind schedule, she hurried her pace. Smith believes that even in work situations not based on piece rate, effort and production are fixed by the worker within a narrow range.

Smith's results are not consistent with those found by Wyatt, Fraser, and Stock (1929a, 1929b) and Wyatt, Langdon, and Stock (1937). They found that boredom was associated with a decline in work rate and that boredom and monotony were greatest in the middle of the day--yielding a U-shaped curve of production and work rate. Smith claims that differences in research methods account for the discrepancy in results.

Smith (1955) studied 72 female mill operators to determine individual differences in susceptibility to monotony. Four hypotheses were not supported by the study. She did not find that the susceptible worker was more ambitious, tended not to daydream, was extraverted, or was more intelligent. Three hypotheses remained tenable in that susceptible workers were younger, more restless, and less satisfied with life in general. Smith concluded that monotony is not a function of the task but of the individual performing that task, and it is related to general factors such as age, daily habits, leisure activities, satisfaction with home life and work situations not directly related to the repetitiveness or uniformity of work.

Gilbertova and Benes (1970) investigated objective and subjective criteria of monotony. Their study involved 490 workers involved in dress manufacturing and 44 operators in a match factory. They developed a questionnaire in which the worker rated his job on a 7-point scale of monotony. It was found that the criterion of duration of the work operation was not sufficient by itself to classify degrees of monotony. The correlation between duration and degrees of monotony was not statistically significant. However, in comparing groups of workers with the highest and lowest degrees of monotony, there were significant differences in the duration of work operations between these extreme groups. The correlation between degrees of monotony and the number of acts in an operation was significant. There was no relationship between degrees of monotony and the percentage of time devoted to preparation or finishing work compared to the total time or duration of the

operation. In all plants, an increase in the number of different operations performed by an operator resulted in decreased monotony. There was some trend that younger workers were more prone to monotony than older workers. Other non-technical, personal factors were related to monotony but not of prime importance. Gilbertova and Benes recommend that the following means can be used to prevent monotony: change of sequence in the work process, change of operations, and the suitable use and spacing of rest breaks.

Stagner (1975) points out that the assumption that repetitiveness and mechanical pacing of work are the primary sources of boredom needs to be modified to include the concept of constraint. Constraint can involve restriction of physical movement, lack of control over the work process, work hours, and work environment. Stagner concludes that constraint, rather than repetition, is the major factor involved in boredom. Stagner reports that six American auto assembly workers were sent to Sweden to try out the Saab-Scania team assembly method. Five of the six American workers preferred the line operation as this repetitive job allowed the worker to daydream while team assembly demanded the workers' undivided attention. Stagner concluded that personality patterns and physiological functioning are related to boredom. Younger, autonomically labile, sensation seeking workers did not respond well to assembly line work. Persons with high ego strength and high authoritarianism adapt well to these jobs.

Davies (1970) believes that differences in temperament determine performance in inspection tasks and that the number of errors detected is an individual matter. In a review of repetitive

tasks, Cox (1970) concluded that the most preferred jobs are those that are well organized and call for one's full attention or none at all.

Gough's (1971) research on and measure of impulse control and self-restraint has been found to be moderately related to work quality. The Personal Reaction Blank is the measure of impulse control and self-restraint. In occupational settings, it has yielded a median correlation of .30 with ratings of quality. Other investigators have found that personality and temperament differences generally affect job performance (Fine, 1972; Pym, 1963; Sofer, 1970).

Geiwitz (1966) used post-hypnotic cues to investigate the role of four variables: decreased arousal, increased constraint, repetitiveness, and unpleasantness or boredom. He found that all four variables alone, with the others held constant, could produce boredom, but the results were stronger for lowered arousal and constraint and less certain for repetitiveness and unpleasantness.

A recent study of boredom and monotony of 370 workers employed by four different companies and representing a wide range of occupations including managers and professionals, clerical workers and operators, and service workers was completed by Quinn (1975). Quinn defined monotony as the workers' perception of the amount of variety in his work and boredom as the affective response to these perceptions. Using an observation technique developed by Jenkins, Nadler, Lawler, and Cammann (1975), he observed five aspects of the task as predictors of monotony and boredom. These included the following factors: (1) the total

number of different tasks performed by the worker, (2) durations or the mean time of the tasks completed over the total number of tasks that the worker performed, (3) repetition, which was the number of times the most frequent task was repeated, (4) ratio of durations and repetitions (duration of each task divided by number of times the task was repeated and summed over all tasks performed), and (5) entropy, which is a statistical measure of the proportion of the work period devoted to each task.

A worker's perception of monotony was measured by two survey-type questions involving how repetitive a worker or observer rated his job and how much variety was contained within the task. Perception of boredom was measured by two fixed alternative questions involving time drag on the job and a rating of how interesting the work was.

The results indicated that task characteristics were significantly related to monotony and boredom. They were more strongly related to the observers' rating of monotony than the workers' perceptions of monotony. In addition, task characteristics were more strongly related to the workers subjective percaptions of monotony than to subjective feelings of boredom.

The best observational predictor of monotony was repetitions (the number of times the most frequently repeated task was repeated).

Results regarding correlations between task characteristics and perceived monotony and boredom are tabled below (N = 370).

Task Characteristics		Perceived By Worker	Monotony By Observer	Workers' Feelings of Boredom
(1)	Number	.07	.36**	.13*
(2)	Durations	.22**	.30**	.11*
(3)	Repetitiveness	.26**	.58**	.19**
(4)	Ratio of Duratio	ons		
	to Repetitions	s .20**	.36**	.10
(5)	Entropy	.20**	.24**	.08

\*p ∠.05.

\*\*p<.01.

Intelligence, which was not measured or estimated by the observer, had no significant effect on the relationship between task characteristics and either monotony or boredom. However, it moderated the relationship between a worker's perception of monotony and feelings of boredom. In more intelligent workers, monotony was more closely related to boredom (p  $\angle$  .05). In addition, the relationship between monotony and boredom was stronger in workers who were more socially active off their jobs (p  $\angle$  .01). Quinn concludes that based on these results, job redesign or enrichment should be based on the autonomy factor rather than variety and should take into consideration individual differences in intelligence and social activity. Quinn (1975) relates his social activity measure to Eysenck's theory of introversion-extraversion-excitation-inhibition theory.

# Inspection-Quality Control

The following general articles are related to inspectiontype tasks. These include articles on the effect of fatigue upon inspection work (Poulton, 1973), daydreaming (Singer, 1974), performance differences in continuous tasks and the effects of auto-arousal (Murrell, 1967, 1969, 1971), human factors in quality control (Harris & Chaney, 1969), and temperament differences in negligence tasks (Davies, 1970).

A field study at an English glass manufacturer found that the introduction of more rapid feedback to inspectors resulted in increased detectability of faults and reduction of the percentage of missed faults by one half. The usual drop in fault detection performance with increased quality was found, and the authors inferred that the inspection group attempted to keep the outgoing percentage of defects constant (Drury & Addison, 1973).

In a later study of the inspection of sheet materials,

Drury (1975) investigated the effect of inspection time on accuracy.

According to Drury, industrial inspection involves two separate
activities which are visual search or scanning and decision

making. When these two activities are studied separately, it has
been found that as more time is allotted to the task, errors of
accepting faulty items decreases, while errors of rejecting
good items increase.

In a series of experiments, it was found that search time varied as a function of flaw size and viewing distance. It was also found that a larger decision time was needed for good sheets than for faulty sheets. As the sizes of good and faulty flaws approach each other, both decision times and errors increased. There were no differences in decision times or errors when reference standards were available.

A study of ten experienced women inspectors investigated the effect of the probability of a defect occurring and paced versus unpaced inspection on inspection efficiency (Fox &

Haslegrave, 1969). It was found that a probability effect was present for the unpaced condition only, which significantly raised the probability of a defect occurring, increased the level of detection of defects, and also increased the number of false detections. Batch size and probability differences resulted in significantly different percentages of inspection efficiency. Productivity

Many business, political leaders, and social scientists are concerned over decreasing productivity levels combined with increasing labor costs. Roy (1951-1952), using a participant observation technique, examined the productive behavior of a sample of industrial workers. He was employed for a ten-month period in 1944 and 1945 as a radial drill operator in the machine shop of a steel processing plant. He worked in a job that was paid on a production piecework basis. Roy concluded that production was being restricted day-in and day-out.

Roy found a bimodal distribution of output which was the rule of the shop. About half of Roy's earnings fell on either side of a day rate, or "make out" rate, or bonus point. The bimodal distribution was not really a simple function of hard and easy jobs. Rather, the men divided the jobs into "gravy" jobs versus "stinkers" based not on the effort or ability required by the job but in terms of how easy it was to earn the bonus or piece rate. On gravy jobs, the operators earned a quota and then knocked off. This was called "quota restriction." Quota restriction resulted from a fear on the part of the workers that there would be cuts in piecework prices if the workers produced too much.

The second type of restriction of production was called "goldbricking," which was holding back behavior or not really trying. On "stinker" type jobs, the workers put forth only minimal effort. The basic attitude was that the company was not going to get much work out of the men for the pay. Goldbricking resulted from resentment against piecework prices.

Roy estimated that anywhere from two to four hours a day was wasted on "quota restriction" or goldbricking and that productivity was only running at 40-70% efficiency.

Whyte (1955) also examined productivity and quota restriction in industry and established individual and group differences between workers who restricted their productivity and those who produced above the group norm (see Chapter VII of this report).

# Technological Change

For many years, a philosophy of technological determinism dominated the job design field. This philosophy assumed that technology exclusively dictated the design and configuration of a technical work system. The job design model of "one best method," work simplification, and specialization was based on this philosophy.

Technological determinism has been used as an excuse to maintain mass production and assembly line technology and deny the possibility of job redesign. A number of researchers have shown that there are relationships between technology, organizational structure, and job design; but yet, there are choice points within a technology based on social values and needs (Cooper, 1972; Cooper & Foster, 1971; Emery, 1969; Emery & Trist, 1973; Harvey,

1968; Herbst, 1974; Hickson, Pugh, & Pheysey, 1968; Hrebiniak, 1974; Inkson, Hickson, & Pugh, 1968; Inkson, Pugh, & Hickson, 1970; Lynch, 1974; Mahoney & Frost, 1974; Mohr, 1971; Pheysey, Payne, & Pugh, 1970; Pugh, 1966; Pugh, Hickson, & Hinings, 1969; Wedderburn & Crompton, 1972; Woodward, 1965, 1970a, 1970b).

Technological change has become a way of life for the worker. Cooper (1972) differentiated five levels of technology differing in the amount of sophistication and the amount of human energy or power and control provided by mechanical devices. He believes that the next stage of technological change will be in the area of information processing and computer control of production.

In office jobs, electronic data processing systems have automated many clerical and account functions. Office work has become as specialized and machine-paced as factory work. automation of the office has resulted in many cases in decreased job satisfaction. Promotional opportunities have been reduced by the computer. Work deadlines and pressures for accuracy have increased (Dunlop, 1962; Crozier, 1965).

The impact of automation has had a widespread effect on all segments of society (Cancro, 1969; Shils, 1963; Walker, C. R., 1962). The following studies represent a few selected field and case studies of workers' reactions to technological change.

### Coal Mining Studies

A classic study in technological change is the work of the Tavistock Institute in the coal mining industry (Trist & Bamforth, 1951; Trist, Higgin, Murray, & Pollock, 1963). Coal mining is regarded as one of the most stressful occupations.

method of mining, the task was carried out by a small group of workers. The groups consisted of two colliers—a hewer and his mate, sometimes assisted by a boy "trammer." Sometimes this group expanded to seven or eight when three or four colliers would work together. The workers chose their own partners and worked on their own small face in the mine. These work groups were multi-skilled and had close—knit relationships which were maintained for years, both on the job and socially.

With the introduction of coal cutters and mechanical conveyors, this old system of self-selected work teams performing in small faces was replaced by longwall coal mining. Conventional longwall mining consisted of groups of 40 men split into 14 separate tasks and spread over three shifts. These tasks included preparing an area to take out the coal, using machines to cut the coal out of the face and removing the coal from the mine by conveyors. Coordination and control of these work groups was in the hands of management. The outcome of automation created a work situation of isolated groups of workers with tension between groups of workers and between management and workers. Productivity decreased, and there were numerous technical difficulties and difficulties in maintaining work cycles.

The "composite" longwall method was tried to overcome some of the problems of the conventional longwall system. Under the composite system, the same mechanical equipment is used, but the work force is allowed flexibility and self-determination of tasks and shifts. Each shift picked up where the last shift left off. The work members were paid on the basis of completing all the tasks of a cycle with an incentive for output. All group members

equally shared in the payment which required equal work from all group members. This composite system restored some of the autonomy and self-regulation present in the old hand-got method to mechanized mining.

Comparisons between the conventional and composite systems were striking and are summarized below:

	Conventional	Composite
Number of main tasks worked on	1.0	3.6
Absence rate total (percentage of possible shift)	20%	8.2%
Productivity percent of estimated face	pog goti gatežis o ven da <u>lo</u> v dr. 3	are bas-dos Marca <u>l</u> mrote
potential	78%	95%

The remarkable aspect was that a work group as large as 41 men could internally control themselves across three shifts in the composite system.

Paterson and Willett (1951) reported a job design experiment designed to reduce accidents in mechanized English coal mines. The investigations diagnosed the problem as lack of cohesion between work groups. The experimental program was designed to make workers continually aware of safety and that each man was interdependent on other workers for his safety. The steel supports were painted with yellow bands to induce a feeling of team spirit and cohesion.

What was first considered to be a symbol of the new cohesion was also found to have a more practical aspect since the color allowed them to more easily line up supports in the straight lines

required for proper support of the roof. There was a reported decrease in the number of improperly placed steel roof supports as a result of the subsequent number of accidents in the experimental group. While cohesion of the worker may be important in reducing accidents, it is impossible to disentangle the effect with merely instructing workers how to use the color cues to properly align these steel roof supports. In any job design study, this is a problem which typically is never properly investigated. The reports of field experiments are so fragmented that it is typically impossible to disentangle the theoretical approach and its effects from potential simple changes in methods of performing the job which may give both increased quality and possible performance.

# Indian Weaving Shed

The reorganization of an Indian weaving shed is another older classic example of job redesign (Rice, 1953, 1958). An automatic loom shed which contained 224 looms was manned by 29 workers. The weaving process was broken down into specialized tasks, and job analysis determined the number of workers assigned to each task. All tasks of the manufacturing process were interdependent. The automatic loom shed, because of task specialization, had a confused task and work relationship with no internal group structure or cohesion. The reorganization of the shed involved grouping workers by geographic divisions rather than functional divisions. All workers who performed interdependent tasks were made part of a work group responsible for the operation

and maintenance of a specific bank of looms. Old occupational titles, based on work specialization, were abandoned (e.g., gater, bobbin carrier, smash hand).

Three grades of workers were established and designated by letters only. The reorganized work groups were internally structured and led. Supervision in the shed was reduced. After an initial period of high damage, the reorganized shed showed increased efficiency and decreased damage.

# Steel Industry

Walker (1957) describes the first continuous seamless pipe mill in the United States. This case study consisted of interviews with 30 mill workers and observations of the mill over a four-year period, from 1949 to 1952. In this technological change, physical effort was eliminated by machinery and less manual skill was required. However, monitoring of the complex automated equipment required more mental effort, and perhaps tension, on the part of the worker. In the old mill, there were small internally led work teams. The layout of the new plant required less men, and one level of supervision was eliminated. The author concluded that as the workers became habituated to their new jobs, initial sources of dissatisfaction became sources of satisfaction.

Banks (1960) studied the changeover to modern equipment in a steel melting job. New blast furnaces and coke ovens were installed, and maintenance units were set up. Banks reported that there was no evidence of hostility toward the change. Production workers were more favorable to the change than maintenance workers.

Older workers who benefited less from the change were not more negative to the change. The continuous shift system set up for the new blast furnaces was a source of dissatisfaction. It should be noted that workers displaced by the technical change were not laid off but placed in equal paying jobs. The author believes that opposition to technical change stems from fear of unemployment, and when the fear is removed, technological change can be a successful, rewarding experience.

Chadwick-Jones (1970) studied the changeover from manual batch production to continuous flow automatic production in a steel tinning mill. The study involved 51 steel workers. Overall, there were more satisfied workers in the new plant as there were improved physical working conditions. Sources of dissatisfaction in the new plant included shift work, boredom in monitoring automatic controls and lack of social relations, as there was less social interaction in the new plant. The new plant resulted in a separation of work and community social ties and a change of status relationships among workers. Workers in the new plant had less job freedom and more direct floor supervision.

A new electric power plant was built which incorporated the latest automatic equipment. Comparisons were made between 300 workers in an old plant and 171 workers in the new automated power plant (Mann & Hoffman, 1960). The new plant involved the mechanization of manual functions and the establishment of automatic control and feedback systems. There was a reduction in the size of the work force, elimination of one level of supervision, and the elimination of craft distinctions among workers.

Maintenance was centralized, and there was general overall greater efficiency in the new plant. Job enlargement and rotation resulted in greater interest and satisfaction in workers in the new plant. However, the men felt more pressure and tension in the new plant. The authors claim that this was due to inadequate training. There were also some problems, as workers disliked continuous shift operations. In the automated plant, workers had greater physical mobility due to job rotation and the centralization of the control system.

### Aircraft Maintenance

Baumgartel and Goldstein (1961) report on the move of three aircraft shops to a new plant. The three shops which moved to the new plant included a plating shop, test cell shop, and a propeller shop. A total of approximately 75 skilled mechanics were moved to the new plant. The new plant incorporated vast technical improvement in the areas of factory design, mechanization, work methods, and working conditions. One shop, the sheet metal shop employing 75 workers, remained in the old plant which was a crowded wooden airplane hanger. A questionnaire was constructed to assess attitudes toward the change. It was found that inspite of perceived technical improvements, there was increased antagonism toward supervision and decreased group solidarity in the new plant. This was caused by a number of factors. There was increased pressure for productivity and more clerical supervision. Jobs in the new plant involved a reduction in complexity, variety, autonomy, and work freedom. In the old plant, there was more freedom in carrying out the work, full use of workers' skill, and the development of interdependent work crews. The new plant had negatively changed groups and individual relationships and the nature of the job.

Shoe Factory

Pym (1965) studied the reaction of 117 female semi-skilled operators to technical change in a boot and shoe factory. Three transporters, consisting of an automatic control panel and two conveyor belts, were installed to carry work from a central store to the machinists and bring back the completed work. The purpose of the new equipment was to centralize the supply of materials and improve the production flow. Work places were arranged so that 50 operators were placed on each conveyor. The operators also became responsible for quality control, and the piece rate was increased. Six months after the change, 33% of the operators were producing less than before the change; twenty months after the change, 82% of the operators were producing more, 11% less, and 7% the same. The individuals were studied some two years after the design change. The two time periods could then be compared to determine if performance could be related to various attitudes held by the worker. Pym was able to predict how the operators would respond to the job change, as a weighted composite of predictors correlated .65 with a performance criterion of output. Specifically, versatility or capacity for change was associated with growth-seeking tendencies; favorable attitude to change, broader leisure interests and a desire for autonomy. Versatility was also negatively related to age. The owner of the property was the tolerance at tolerance

### Production Changes

Fleishman (1965) investigated the effects of worker participation on a style change in a dress manufacturing company. An experimental group of 20 female sewing machine operators were given the opportunity to participate in a style change by determining the operation sequence, the bundling procedure, and the pricing of individual operations. The performance of the experimental group was compared to two control groups of workers. It was found that attitude factors, rather than skill differences, were the major contributors to drop and recovery at the style changes. Since the differences in production between the experimental and control groups were not statistically significant, it was inferred that direct participation of individual workers might not be as important as their perception of group participation in the change.

Other data on the general production records of these operators indicate that it took about seven weeks for production to stabilize after a style change. The drop that occurred with each style change was considerable and was independent of the level achieved on the previous run. Individual workers had a high degree of stability of production over a six-month period. It was also found that the correlation between experience on the job and productivity was .32. This relationship does not level off and persists even with workers who have 35 years of experience with the company. Fleishman concludes that there appears to be an implicit form of goal setting going on each day.

Earlier studies of worker participation in job changes at the Harwood Manufacturing Company are reported by Coch and French (1948) and at a Norwegian footwear manufacturer (French, Israel, & As, 1960).

#### Office Automation

A number of technological changes in the 1960's involved the installation of electronic data processing systems (EDP). In a study of attitudes toward office automation, Trunko (1961) identified a number of individual and group variables related to change. The sample included 232 non-supervisory and 46 supervisory personnel of an insurance company involved in office automation. Results from questionnaire data indicated that females scored lower on a change scale than males. Change scores were positively related to a measure of general ability, education, and freedom from job anxiety. Change scores were negatively related to group cohesiveness and authoritarianism. Attitudes toward change were found to be related to group membership, as change scores within a group were more homogeneous than change scores between groups. Change scores were higher among employees who perceived increased variety, skill, responsibility, and the possibility of promotion in the year preceding the change. The results also indicated the effect that work related changes had on social relations and work groups.

Another EDP installation in the accounting department of a power plant was studied by comparing 88 clerical employees in computer type jobs with 80 clerical workers not working on the computer system (Mann & Williams, 1962). Workers in EDP related

jobs reported greater satisfaction with the amount of job responsibility and that their jobs had more opportunity to learn new skills and more variety. However, the workers in the EDP related jobs had greater exposure to risk and had higher performance standards and more deadlines. They also felt that management was less interested in them, and workers in EDP jobs worried more about layoffs and their futures. There was also some data to indicate that the increased job pressure of EDP jobs resulted in more symptoms of psychological and physical anxiety.

A large capacity computer system was installed in a shoe manufacturing plant for production planning and merchandising functions (Lee, 1965). Clerical employees ( $\underline{N}=19$ ) and managers ( $\underline{N}=21$ ) were interviewed to determine the effect of the EDP system on their work. These forty employees had previously worked under the old system. The major findings were that the EDP system imposed an increased number of work deadlines, decreased control over the the work pace and sequence of work, decreased freedom and flexibility of the work method, increased interdepartmental cooperation, and increased task variety. All employees expressed increased satisfaction with the work. This increased satisfaction may have been a function of improved job performance. It was also reported that the EDP system resulted in a total reduction of the workforce from 186 to 120.

Gruenfeld and Foltman (1967) investigated the installation of EDP equipment in a steel foundry to process information for

accounting, production scheduling, inventory control, and payroll functions. The study involved 40 first-line manufacturing supervisors. Results indicated that supervisors who were higher in job satisfaction and more satisfied with management were more likely to accept technological change. However, the changeover failed and the EDP system was discontinued because the information supplied to the system by supervisors was unreliable. Interviews with the supervisors also indicated that they were unwilling to assume the additional tasks required by the EDP system. The authors report that prior to the technological change, the relationships between management and first-line supervisors were strained. Supervisors maintained stronger social and work ties with subordinates than management. They complained about wage inequities in that workers with overtime earned more than they did. The technological change, therefore, failed as it had aggravated a long-standing work related problem.

# Job Change-Turnover

A number of studies have indicated that labor turnover and absenteeism are related to dissatisfaction with the work itself. The following review articles have summarized the research literature on forms of withdrawal from work: Brayfield and Crockett, 1955; Herzberg, Mausner, Peterson, and Capwell, 1957; Hinrichs, 1970a; Porter and Lawler, 1965; Porter and Steers, 1973; Quinn, Staines, and McCullough, 1974; Schuh, 1967.

#### Turnover on Assembly Lines

Guest (1955a) intensively interviewed eighteen men who quit their assembly line jobs after 12 to 15 years experience. The

study indicated that the most important source of dissatisfaction was the work itself. Even after years of experience, these men could not adapt to repetitive machine-paced work. Of the 18 men who quit, only three went back into factory work, and not one of these three went back to repetitive conveyor-paced work. The majority of men who quit their jobs were getting less pay on their new jobs. More than half of the workers worked full-time or part-time out of doors on their new jobs. A comparison of the 18 men who quit with 202 workers who remained on assemblyline jobs found that those who stayed in their jobs had more dependents. The men who quit their jobs had equal, if not slightly higher, performance ratings in their auto jobs. It was also found that about 50% of the 202 men who stayed on the job had thought about quitting but remained on their jobs out of fear of finding a job at lower wages, losing seniority because of their advanced age, or apprehension that a new job might be like their old job.

In conclusion, Guest stated that the men who quit their auto assembly jobs had no seniority on their new jobs, had less income, but were more independent and more in control of their work pace.

Looking at this problem from another direction, a number of studies have compared automated jobs with old craft type jobs. Faunce (1958a, 1958b) found in a study of 125 automobile workers that automated jobs, in comparison to old jobs, reduced the amount of materials handled. Workers reported no control over their work pace on automated jobs, and these jobs required constant

attention which resulted in more mental fatigue. Workers reported closer and more frequent supervision in automated plants. The work itself did not require additional skills but did involve more responsibility. A frequent complaint was that social interaction on automated jobs was decreased by distance between workers and noise factors. A study of 180 auto workers found that their old jobs bore little resemblance to assembly-line jobs, as they were not repetitious or machine-paced (Walker & Guest, 1952). In this sample, 80% of the workers considered the economic factor as the principal reason for liking their current automated jobs.

#### Natural Job Progression

Simonds and Orife (1975) avoided some of the pitfalls of field research by the use of natural job progression to determine the value of enriched jobs. The opportunity to study this question in a natural setting was provided by investigating 37 jobs in a pharmaceutical company and 34 jobs in a furniture company where employees transferred jobs. A comparison was made between the employees' old and new job (preferred job).

Of the 71 pairs of jobs (old and new jobs), 51 of the transfers were to jobs equal in pay and only 4 transfers to lower paying jobs.

Enrichment levels, work methods, pace, quality control, machine setup, and planning were established for 44 of the 71 job pairs. It was found that 30 of the new preferred jobs were more enriched, 8 had the same degree of enrichment as the job the worker left, and 6 of the new, preferred jobs were less enriched. In considering the 11 jobs out of these 44 that did

not involve a pay increase, the pattern was different. Five of the new preferred jobs were more enriched, three equal in enrichment; and in three cases, they were less enriched. These results showed that the majority of higher paid jobs to which workers moved were more enriched, but when the job shift did not provide a pay increase, the new jobs were not always more enriched.

Routineness was established for 68 pairs of jobs. In 34 transfers, the new, preferred job was less routine (in number of tasks, variety, repetitiveness, length of job cycle); in 11 transfers the two jobs were rated equal, and in 23 transfers the new, preferred job was more routine.

When pay increase was eliminated as a possible purpose of the transfer (by observing pairs of jobs where the transfer did not increase pay), there was no significant differences in job enrichment or enlargement. In fact, there were 15 transfers in which jobs at higher pay were chosen despite their being more routine.

This study concluded that there was strong support for the view that pay increases for non-supervisory personnel may be more important than differences in job enrichment or task variety.

## Studies of Congruence Models

### Cognition

Task perception and preferences form an integral part of congruence approaches to job design. There is a growing body of research that indicates that there are wide individual differences in the cognitive perceptual realm which influences work behavior. Cognitive complexity or simplicity refers to the degree of dif-

ferentiation of a person's system of constructs for understanding and interacting with the environment (Bieri, 1955).

The first attempt to relate cognitive complexity to work attitudes and behavior was completed by Standing (1971, 1973). In a field study of 63 steel mill inspectors, he found a curvilinear U shape relationship between cognitive complexity and job satisfaction. Inspectors whose cognitive structures were complex or simple were less satisfied with the work itself than inspectors whose cognitive structure were moderately complex. Cognitive complexity was significantly related to four other aspects of satisfaction: promotion, supervision, amount of say on how the job is done, and feedback from the job. High cognitive complexity inspectors were less satisfied with these aspects. This dissatisfaction was interpreted as a function of simplifying constraints placed upon an inspector's job behavior. These results suggested that there is an optimum level of cognitive complexity for individuals and for jobs. Workers in jobs above or below their optimum level will experience relatively less satisfaction with the work itself.

Another variable, cognitive style, has been related to job satisfaction, motivation, and job performance. Analytic field independent individuals rely on internal cues in perception. They can separate the discrete parts of a problem or of their environment. Global or field dependent individuals rely on environmental cues in perception and have difficulty in separating and analyzing situations. Research has indicated that field independent individuals react more favorably to jobs nigh in desirable

attributes (Gruenfeld & Weissenberg, 1970) and to changes in job structural attributes (Barrett, Cabe, Thornton, & O'Connor, 1975).

### Job Pressure Need Satisfaction and Effectiveness

Other field studies have tested more than one or two variables of congruence models.

Hall and Lawler (1970) studied the interaction of five job characteristics (wide range of projects, independent budget, job challenge, direct customer contact, and financial responsibility); three job pressures (quality, time, financial responsibility); need satisfaction; job involvement; and organizational effectiveness. The sample consisted of 22 research and development organizations. The results indicated that different job characteristics were related to different job pressures. more challenging the job, the more likely a researcher was to experience quality pressure. The amount of responsibility the researchers had for dealing with customers, the more financial responsibility and time pressure they felt. Three of the job characteristics showed significant relationships with higher order need satisfaction. Job challenge was related to satisfaction, while working on a wide range of projects, and having an independent research budget were sources of dissatisfaction. Global performance was related to both financial responsibility and quality pressure but not to time pressure. Only quality pressure was related to job involvement.

### Tennessee Valley Authority

In a study of five units of the Tennessee Valley Authority, a number of interesting relationships were found between individual achievement motivation, job factors, and identification with the work organization (Patchen, 1970). The units studied included two engineering divisions and three steam power plants with a range of jobs including engineers, draftsmen, boilermakers, machinists, and clerks. Data was obtained through questionnaires and attendance records. The results based on job characteristics indicated that jobs of moderate difficulty, high control over work methods, and high feedback led to higher achievement incentive or motivation when the rewards for achievement were high. They found that job difficulty and control over work methods were the most important job characteristics and that the relationship between other job core characteristics on motivation may be additive and not multiplicative. Stress on the job was found when workers lacked the abilities to complete difficult work and when people in difficult jobs had frequent time limits, low control over work methods, and low feedback on performance.

The study reported that the early work on achievement motivation emphasized this motive as an internalized personality characteristic based on early life experiences. The result from the Tennessee Valley Authority study showed that the expression of achievement motivation and interest in the job may be a function of the job itself and whether the job provides opportunities and rewards for achievement.

The second focus of the study involved worker identification with the work organization. This was a function of employee participation in decision-making at the job and at higher organizational levels, work group cohesiveness and solidarity, chance to use one's best abilities, and perception of common goals. A negative relationship was found between occupational identification and organizational identification. Tenure was also related to organizational identification but not the perception of common goals. The results of the study point to the complexity of variables interacting within the work environment.

# A Failure of Congruence Theory

Baker and Hansen (1975) tested two important propositions of their congruence model. First, they examined data from blue-and white-collar workers to see if differences in job content and design actually affected worker satisfaction. Second, they attempted to see if a match between preferences for structure and the actual structure of the job would lead to increased job satisfaction.

Their conceptualization indicated that job structure dimensions, such as precise rules, regulations of established conduct on the job, and enforcement of such rules and regulations, were the most important defining characteristics differentiating enriched from non-enriched jobs. Based upon this conceptualization, they developed an instrument to measure tolerance for structure, and at the same time, an instrument to measure the structure of work roles.

The individual's orientations toward tolerance for structure were tapped by questions such as "I would like to have a job where I could set the hours" (Baker, Etzioni, Hansen, & Sontag, 1973).

The structure of the work roles was obtained by either a trained interviewer or a supervisor who answered 45 questions covering the five areas of work behavior: (1) the number of rules describing how a task shall be done; (2) the number of regulations governing conduct on the job; (3) the degree of rule enforcement; (4) the extent of the supervisory hierarchy; and (5) the closeness of supervision.

The results from the job structure scale indicated that there was variation both in blue- and white-collar jobs. For example, taxi drivers have jobs with low job structure, while the group of textile printing operators have relatively high job structure. In a similar fashion for white-collar jobs, the nurses' aids had relatively high job structure, while college secretaries had low job structure. There was also variation in the mean scores of the workers performing these jobs on the tolerance-for-structure scale. A general finding was that the younger and college educated workers had less tolerance for structure than the older workers.

It was the authors' contention that some recent job redesign studies have been based upon the implicit assumption that the less the job structure, the greater the overall job satisfaction. The results presented by Baker and Hansen did not

support that proposition, as the degree of job structure was not inversely related to the degree of satisfaction for white- and blue-collar workers.

An alternative assumption was also tested that the greater the congruence between the worker's preferences and the job structure, the greater the degree of satisfaction. The results were quite different. The relationship was found to be linear between individual tolerance for structure and individual job satisfaction. The greater one's tolerance for structured jobs, the greater the satisfaction with the job across all types of jobs, regardless of the actual rated structure of the job. implications of this are that within the range of jobs studied, individuals who had a low tolerance for structure would not be likely to gain the greater satisfaction by having a position with less structure. Therefore, a selection model would not appear to be particularly helpful in terms of increasing job satisfaction. In the same manner, changing the structure of a job by some job redesign technique would not appear to have any noticeable effect on the job satisfaction of the incumbents.

There is also the alternative of trying to increase the tolerance for structure for those who are very low in this characteristic. Baker and Hansen (1975) indicate that training attempts to have employees adjust to higher structured jobs appear to be very difficult, and attempting to alter their preference would appear to be a task which has not been successfully accomplished in the past.

In short, Baker and Hansen are very pessimistic about changing either the structure of the jobs in our society or in some way modifying the individuals who take these positions in order to bring about increased job satisfaction. These conclusions may be a function of the nature of the jobs studied by Baker and Hansen and that the range of jobs studied was somewhat restricted. The lowest structure white-collar job was that of a college secretary. Higher level managerial and professional occupations were not represented. The lowest structure blue-collar job was that of a taxi driver. Skilled or craft jobs were not included. In addition, only one job characteristic was studied, job structure.

### Other Studies Related to Congruence Models

Calitz, Hilaael, McCormick, and Peters (1974) studied the match between an incumbent's job characteristics and his expressed job interests. The sample consisted of 407 workers in nine management and 20 non-management jobs in two telephone companies. Job characteristics were measured by the Position Analysis Questionnaire (PAQ), and interests were measured by the Job Activity Preference Questionnaire (JAPQ). The results supported the hypothesis that the match between a worker's interests and job characteristics was related to job satisfaction. Prediction of satisfaction was higher for management jobs than for non-management jobs.

Other research has found that the congruence between preferred and described job structural attributes resulted in higher job satisfaction (Barrett, Bass, O'Connor, Alexander,

Forbes, & Cascio, 1975). These research results were based on a congruence between job structural attributes of responsibility, variety, independence, and learning new skills.

Downey, Hellriegel, and Slocum (1975) found there were significant interactions between personality and measured climate dimensions in the organization as related to both satisfaction and performance. The results have to be considered preliminary in nature, since the instrument selected measured both climate and satisfaction data at the same time. There may be a possible confounding, and moreover it is never clear how past performance in the organization may have shaped both present perceptions of the organization and satisfaction.

Schneider (1974c) has found that the fit between climate expectations and climate preferences in a sample of new life insurance agents ( $\underline{N}$  = 194) was not related to either sales or tenure after one year. Further statistical analyses and clustering of agencies did produce some significant predictions of new agent success.

O'Reilly and Roberts (1975) studied whether job attitudes were more related to individual differences or structural characteristics of the organization. In a study of 578 Naval officers and enlisted men, the following variables were assessed: job satisfaction, individual traits (Ghiselli Self-Description Inventory), three structural characteristics (Naval rank, Naval tenure, and tenure in current assignment). The results generally found that attitudes were determined more by the structural characteristics than the person or individual traits. O'Reilly

and Roberts state "models proposing direct links between individual differences (independent of the organization) and satisfaction with the job do not seem warranted in the basis of these data". (p. 149)

These studies represent initial attempts to test propositions of congruence models.

### Work Restructuring

A complete summary of job redesign projects is included in Table 3, "Work Restructuring Projects." This table lists entries in alphabetical order by the name of the company. Early Controlled Studies

One of the first controlled studies of job enlargement was completed by Marks (1954). Details of the project are reported by Davis (1966) and Davis and Canter (1956). The research study took place at a West Coast manufacturer of a small plastic appliance. The project had been manufactured on an assembly line at which 29 female operators performed one of the nine separate operations. In this line job design, the workers were spaced at stations along a conveyor belt. Job rotation from hard to easy stations occurred every two hours. There was no individual responsibility for quality of performance in the line job design. The 29 workers had an average of 2-1/2 years of experience in these jobs.

Two experimental designs were compared with the line job design. These were a group job design in which the conveyor was eliminated, and workers rotated between the nine job stations using a batch method of assembly. The second new design involved one worker completing all nine operations, including inspection

Table 3
Work Restructuring Projects

Name/Type Company	Type of Worker	. и	Job Ch Change	anges Result	Job Design Principle	Reference
Alcan Aluminum (Aluminum Co. of Canada, Arvida, Quebec)	Machine operators	47	job rotation; reduction of supervision; improved communi- cation	improved productivity; 7% improved attitude; im- proved skill level of worker	horizontal loading vertical loading	Davis, Cherns, & Associates (1975h) Chapter by Judit T. Archer
AT &T	19 field studies frame men, toll operators, clerks, key- punch operators, engineers, correspondents, service repre- sentatives	apx.	redesign to mean- ingful unit of work; increase personal accountability; reduction of supervision and controls; improving knowledge of results	reduced turn- over and absenteeism; slight increases in production; improved attitude (satisfaction)	vertical loading	Ford (1969a, 1969b) Foulkes (1969)
AT &T	female correspondents	not re- port- ed	seven job enrich- ment elements added to the job	improved pro- ductivity; decreased turn- over; improved attitudes	vertical loading	Stewart (1970)
AT 6T	directory assistance operators and supervisors	61	increase in job autonomy and variety for operators	no change in attitude for pre- post & enrich- ment; decreased interpersonal relations; super- visors become less secure; re- duction in necessary train- ing time		Lawler, Hackman, & Kaufman, (1971
American Velvet	textile firm	400	profit sharing; worker participa- tion in safety, job design and all company matters	company and workers have prospered	Worker participation	Dickson (1975) Foulkes (1969)
Atlas Copco Mining Co. Sicklawork Sweden	drill assemblers	12	team bench assembly; responsibility for set up, work pace and work method; reduction of supervision	increased productivity +5%; improved attitude	vertical loading horizontal loading	Bjork (1975)
Bank	Auditing clerks	exp =18 con- trol	natural unit of work by combining debit credit; month end balancing and con- trol of cash flow; clerks assigned to companies; reduction of verification and supervision	increased productivity; reduction of errors; improved attitude; reduced turn- over	vertical loading horizontal loading	Maher (1971) Chapter by Robert Janson
Bank	production typists	exp -40 con- trol	added responsi- bility for correcting mis- takes, changing computer tapes; increased feed- back; assigned to companies	increased productivity; improved quality; improved attitude	vertical loading horizontal loading	Maher (1971) Chapter by Robert Janson

Name/Type Company	Type of Worker	N	Job Cha Change	Result	Job Design Principle .	Reference
Bank	stock transfer clerks	28	semi-autonomous work groups; job rotation; increased feed- back and responsibility	total failure jobs got worse after change	vertical loading horizontal loading autonomous work groups job rotation	Frank & Hackman (1975)
Banker's Trust	typists	200	changed computer input; typists handling specific customers; checks and schedules own work	improved attitude; decreased absenteeism; im- provement in production and in quality of production; prob- lem with transition changes for supervisors	loading	Dettelback & Kraft (1971)
Banker's Trust	deposit account- ing clerks	not speci- fied	increased respon- sibility and task variety; handle specific bank branches; improved feedback; reduced supervision	improved productivity and quality; decreased turnover; lower costs	horizontal loading vertical loading	Kraft & Williams (1975)
R. G. Barry Corporation	shoe manufac- turer operators	350	semi-autonomous work teams; responsibility for set up, work methods and quality; removal of time clocks; piece rate re- placed by straight wage; team goal setting	improved quality; large investment to convert to team production; decrease in absenteeism; unit manuf. cost slight decrease	vertical job load horizontal worker participation	Davis, Cherns, & Associates (1975b) Chapter by Mark Frohman . Gooding (1970)
Richard Baxendale & Sons, Ltd. United Kingdom	manufacturers of domestic central heaters		modular assembly of entire unit; increased respon- sibility for inspection; worker participation; productivity deals	problems pay system with redesigned job improved quality 200%; decreased absenteeism	vertical loading worker participation	Taylor (1972)
Calico Mills (India)	textile workers		restructure workers into groups; re- duced supervision; elimination of old work titles	higher production and less damage	vertical loading	Rice (1953) Rice (1958) Davis & Canter (1956)
City Government Civil Service	clerical		meaningful work unit; increasing responsibility and recognition; providing new opportunities advancement	improved attitude; improved perfor- mance ratings; no difference absenteeism	vertical loading horizontal loading	Comez & Mussio,
Colonial Insurance	underwriters	4	responsible for entire policy application	increased production	horizontal loading	Guest (1957)
Colonial Insurance	debit clerks		responsible for accounting and billing	improved quality of work; reduction in absenteeism and turnovers; improved attitude	loading	Guest (1957)

Table 3 (Cont'd.)

Name/Type Company	Type of Worker	N	Job Cha Change	nges Result	Job Design Principle	Reference
Company "x"	assemblers production workers documentation clerks	Not re- port- ed	machine operators given maintenance & quality control tasks; work teams formed for entire work module & unit; documentation clerks given full responsibility for pulling, filing, distributing, and inspecting documents, and also contacting customers	improvement in quality and productivity; reduction in maintenance costs; reduced absenteeism; improved attitude; easier to identify source of errors		Sirota & Wolfson (1972a, 1972b) Sirota (1973a 1973b)
Corning Class Medfield, Mass.	manufacturer electronic lab instruments	ly 15 tech- ni- cal cler- ical 8	autonomous work groups; modular assembly; responsibility for quality control, setup purchasing inventory control; increased worker participation; increased feedback	increased productivity ranging from +17 to +84%; improved quality +50; decreased absenteeism and turnover; one- third reduction first line super- visors and elimination of one level of supervision	vertical load- ing horizontal loading organizational development	(1971)
Cryovac (W.R. Grace Co., Calif.) new plant	machine operators, inspectors, packers	re- port- ed	completion of work module; increased feedback; decision making & control; worker participa- tion job changes	lower costs; improvement in work quality	vertical loading (plan-do- control) worker participation	Powers (1972) Glaser (1974) Davis, Cherns & Associates (1975b)
Cummins Engine Co.	engine testing		increased responsibility for inspection, ordering and budgeting supplies	not evaluated	joint problem solving; vertical loading horizontal loading	Davis, Cherns & Associates (1975b) E. James Bryan
Cummins Engine Co.	keypunch operators		increased authority to schedule work, contact clients; team work rush jobs; correct own work and errors	cost savings 18,000 yr. by eliminating 3 group leaders; 50% decrease over- time; 25% reduc- tion turnover	joint problem solving; vertical loading (plan-do- control); horizontal loading	Davis, Cherns & Associates (1975b) Chapter by E. James Bryan
Cummins Engine Co.	fabrication machine shop		reorganization work station	decreased cost of manufacturing one item from \$6.00 to \$1.88		Davis, Cherns, & Associates (1975b) Chapter by E. James Bryan
Cummins Engine Co.	automated block line	25	new line introduced team work job rotation; added responsibility for maintenance, scheduling, technical problems	decrease in number of workers from 25 - 14; quality high; safety good	joint problem solving vertical loading job rotation	Davis, Cherns, & Associates (19755) Chapter by E. James Bryar

Table 3 (Cont'd.)

Name/Type Company	Type of Worker	N .	Job Char Change	nges	. Job Design Principle .	Reference
Graflex	Manufacturer precision cameras		operator has responsibility for inspection and quality; improved feedback with accountability; cooperation production and engineering debts	decreased costs; improved quality		Tangerman (1953)
Harwood Manufacturing Weldon Co.	garment manufacturer		revised plant lay- out and reorganiza- tion; training programs and coaching of low performance pperators; change in pay rates; group problem solving	improved production little change in worker attitudes; decreased turnover and absenteeism	job loading; training programs	Katzell, Yankelovich, & Others (1975) Coch & French (1948)
H. B. Hood & Sons (Boston, Mass.)	not specified		increased employee participation in work simplification guaranteed job security	reduced resistance to job changes; cost'savings of \$10,000	work simplifi- cation; worker participation	
Hoover Ltd. Perival England	manufacturer		autonomous work groups; job rotation; natural work unit; group bonus pay plan	increased productivity +9%; increased group cohesiveness	vertical loading; horizontal loading	Dyson (1973)
Hunsfos Sulp & Paper Mill (Norway)	machine operators	32	autonomous work groups; elimination of floor super- visors; group pay incentive plan	increased production; improved attitude	vertical loading Scalon plan; autonomous work groups	Engelstad (1970
IBM (Endicott, N.Y.)	machine operators	200- 300	increased worker responsibility for set-up, maintenance, and inspection	improved quantity; less machine & operator time required for production	vertical loading.	Walker (1950)
IBM	quality inspectora	70	elimination of step by step inspection; final quality analyst given full responsibility for all quality problems	improved perform- ance & quality; lower costs of production; improved attitude	vertical loading	Maher, Overbagh, Palmer, & Piersol (1969)
Imperial Chemical Industries (England)	lab technicians; sales representa- tives; design engineers; fac- tory supervisors and foremen	total not re- por- ted.	job rotation; forming of small groups of workers; addition of tech- nical, financial, and mangerial as- pects to the present job struc- ture of the workers	improved produc- tion; improved sales; fewer work stoppages; decrease in costs; decrease in needed super- vision.		Paul, Robertson, & Herzberg (1969) Paul & Robertson (1970
Imperial Chemical Industries	Nylon spinning workers	40	productivity bar- gaining; responsi- bility for quality and maintenance.	improved produc- tivity; improved quality; fewer grievances	vertical loading; job rotation; profit sharing	Cotgrove, Dunham, & Vamplew (1971)
Industrial Corporation	scientists and technicians of R & D center	153	elimination of one level of manage- ment; formation of project groups; senior managers involved in long- range technical planning	mixed results; increase in responsibility and authority; in- creased motivation resulting in greater satisfac- tion and higher productivity, but this occurred moreso for scientists than	vertical loading	Dalton, Barnes, & Zaleznick (1968).

Name/Type Company	Type of Worker	N	Job Char Change	Result ·	Job Design Principle	Reference
Dexion- Comino Internation- al Ltd. (U.K.)	construction &	not spec- ified	responsibility		vertical loading horizontal loading	Taylor (1972)
Detroit Edison	clerical & first line supervisors; workers in customer billing department	re- port-	answered customers requests	tion; decreased costs; improved attitudes; indication that some	horizontal , loading; expansion of job to include other related tasks	Elliot:(1953)
Donnelly Mirrors	manufacturer	400	work teams of 10 or few workers; change over from hourly to all salaried;	tivity +48%; increased quality +6.8%; decreased	loading; nutonomous work groups; modified Scanlon Plan	Davis, Cherns, & Associates (1975b) Chapter by Samual C. Imam Gooding (1970) Dickson (1975)
Dow Chemical	maintenance and distribution workers	223	centralization and broadening of job responsi- bilities	lower maintenance costs; improvement in work quality; improvement in wor attitude	expansion of	Devis & Werlin (1960)
Electricity Board U.K.	Record clerks	not re- port- ed	with EDP. install	improved attitude;  a- less super- vision; lower costs; overall performance droppe initially then hit old standard		Taylor (1972)
General Electric (Electron- ics Plant)	female/male assembly workers	140	worker participation in decisions; worker understanding of job role and role training; worker participation in quality goals	improved quality; improved produc- tivity; improved attitudes	vertical loading; worker participation	Sorcher (1969) Sorcher & Meyer (1968)
General Foods Pet Dog Food Plant New plant	machine operators	70	autonomous work groups; operators given staff & decision functions; pay based upon total number of job operator could do.	reduced labor costs; problems involving tension over pay; group pressure on sindividual; unwillingness by some to accept additional respon- sibility	vertical loading; autonomous work groups	Walton (1972a, 1972b)

Name/Type Company	Type of Worker	N	Job Char Change	Result	Job Design Principle	Reference
Industrial Corporation	Clerical workers Four division	206	Autonomy program in two divisions increased employees role in decision making. Hierarchial program decreased employees' role in decision making.	creased in hier-	vertical	Morse & Reimer (1956)
Insurance company & Oil Refinery	non-supervisory workers		increase in peer leadership; intro- duction of group processes	oil refinery groups with more sophisticated techniques showed increase in group processes; insurance company experimental changes not successful	vertical loading; increased participation	Taylor (1971b)
Kaiser Aluminum (West Virginia)	maintenance workers	60	reduction in job supervision; workers determine jobs to work on and their work schedules; elimina- tion of time clocks; elimination of night shift	decrease in maintenance costs 5%; improved cuality of work; fewer grievances	vertical loading	Thompson (1971)
Kaiser Steel	Pipe mill steel workers		worker partici- pation in pay scales, equipment purchases, maintenance and job redesign	increased produc- tivity; management union cooperation to save plant from closing	worker	Glaser (1974)
Kodak	camera manufacturer	spec- ified	modular work teams with a head operator; responsi- bility for work schedules, work methods, quality control; reduction of supervision	cost savings; improved quality; decreased absenteeism and turnover	vertical loading; horizontal loading	Lovely (1972)
Maintenance Service Company	part-time cleaners	117	pay incentive; plans developed by workers themselves to record attendance vs. alternate group which did not participate in the plan but did receive incentive	attendance in	vertical loading; pay incentive; worker participation	Lawler & Hackman (1969)
Manufacturing Company (West Coast)	female assemblers	29	comparison of line job assembly, group job design, and individual modular job design	quality improved individual job design	vertical loading; job rotation; horizontal loading	Marks (1954) Davis & Canter (1956)
Automobile manufacturer	assembly and utility workers	600-	ob rotation; introduction of training program	no difference in work attitude be- tween assembly vs. utility workers; in utility groups receiving train- ing, utility workers had higher mean attitudes	job rotation; job training	Kennedy & O'Neil (1958)

Table 3 (Cont'd)

Name/Type Company	Type of Worker	N.	Job Cha Change	nges Result.	Job Design Principle	Reference
Manufacturing Company	machine tenders	re- port- ed	introduction of high school courses technical training; new machinery; increased emphasis on interpersonal relations		vertical loading	Alderfer (1969)
manufacturer Iowa-drive mechanism	assemblers	re- port- ed	modular assembly with 5 stations in which each worker assembles and tests entire unit	37% reduction labor costs; decreased reject rate; in- creased cycle time to six minutes	loading; horizontal	Tuggle (1969)
manufacturer Wisconsin furnaces	assemblers	re- port- ed	assembly line production changed to modular assembly with 8 independent assembly lines manned by two workers who assemble and test unit in 10-12 minutes	increased flexibility	vertical, loading; horizontal loading	Tuggl <b>e</b> (1969)
manufacturer Wisconsin appliances	assemblers	re-	team assembly of entire unit (2 workers, 1 male, i female); change in material handling system	24% reduction labor costs; increased product flexibility	loading	Tuggle (1969)
Manufacturing company	female assemblers	17	creation of autonomous work groups	factory workers in enriched jobs did not differ from computer college personnel in supervisor rating of correlation of motivation with self-actualization.	vertical loading	Huse & Price (1970)
Manufacturing company (Midwest)	press and assembly workers	400-	knowledge of pro- duction results by a variety of methods	"some" improvement	vertical loading; plan- do-control- feedback process	Migliore (1970)
Mdnufacturer clothing patterns	4 plents machine operators	360	Effects of expec- tancy on job enlargement and job rotation.	Expectations managers had about change programs had more effect than actual changes	vertical and horizontal loading	King (1974)
Manufacturer (Midwest) Construction materials	blue collar clerical managerial temporary	11 10 8	diagnosis of prob- lem; data feedback; supervisory skills training; team building; group problem solving		organizational development; worker participation	Hautaluoma & Gavin (1975)
Manufacturer complex product	assembly workers	150	small group assembly of part of the product; auto- mation of other tasks; unmechanized short cycle machine paced tasks; smooth work flow.	not evaluated as yet; job design based on efficiency and quality of work life.	simplification;	Lupton (1975)
Maytag -Home laundry equipment manufacturer (Midwest)	assembly workers	60	from line assembly to bench assembly for entire unit; quality control	improved quality of work; lower costs; longer training time; reduced social interaction; reduction in job delay time	wertical loading; horizontal loading	Conent & Kilbridge (1965) Kilbridge (1960b)

Table 3 (Cont'd.)

Name/Type Company	Type of Worker	N	Job Cha Change	nges	. Job Design Principle	Reference
Maytag (Iowa)	assembly workers	110	combination of assembly and quality control	improved quality; lower labor costs; improved worker attitude	vertical loading	Biganne & Stewart (1963)
Medical Specialties Co.	production workers	60	worker participa- tion in job changes improvements made in product design, work structure and organization	decreased labor grievances; productivity rose 32% and rejects fell from 12-9% in three months; decreased turnover and absenteeism	vertical loading; worker participation	Glaser (1974)
Mercury House Group	publishing firm clerical personnel	450 apx.	increased responsibility; write own business correspondence; attend press conferences, some editing of press releases and advertising copy; decreased supervision; direct dealing with client	decreased turn- over from 61% to 48% (1 year)	vertical loading; horizontal job loading	Taylor (1972)
Monsanto	textile chemical	hous	more training worker participa-	improved quality;	vertical job	Rush (1971)
	plant		tion in job restructuring; in- creased responsi- bility and freedom to regulate con- trols of automatic process and trouble shoot; improved feedback; improved training	each operator able to monitor and control 50% more panels; 1/2 of supervisors jobs eliminated; no	loading; worker participation	
Mons anto	agriculture division machine operators	150	increased responsi- bility for main- tenance, set up, work pace, opera- tors set own production goals and measure their own progress	increased production +75%	vertical job loading; horizontal job loading	Rush (1971)
Monsanto	organic division		increased responsi- bility, hourly employees perform salaried type jobs; change in organiza- tional structure to product teams; goal setting; reduction supervision		vertical job loading; horizontal job loading	Rush (1971)
Monsanto	electronics division foreman	not spec- ified		lower turnover in these semi-skilled jobs	vertical job loading; horizontal job loading; training.	Rush (1971)
Motorola .	female assemblers	not spec- ified		tories; decreased	vertical job loading; horizontal job loading	Davis, Cherns, & Associates (1975b) Chapter by Claude Davis Parke & Tausky (1975)

Name/Type Company	Type of Worker	N	Job Cha Change	nges Result	Job Design Principle	Reference
Non-Linear Systems (California)	workers from whole plant	225-	team of workers; self-paced produc- tion; increased worker responsi- bility; increased accountability	company expansion; company changed back to conven- tional production	vertical loading	Kuriloff (1963)
Norsk Hydro	workers from production- fertilizer factory	50	autonomous work groups; reduced supervision; introduction of a group bonus plan.	increased produc- tion; lower labor costs, reduction in absenteeism; improved work attitude.	vertical loading; autonomous work groups; job rotation; Scanlon Plan	Bregard & Gulowsen (1962)
North . American Rockwell	supervisors and workers in computer manufacturing	super visor 60 work- ers	employee participa- tion job design; group problem solving	increased output; improved job attitude; high group participation	vertical loading; increased participation	Chaney (1969)
Northern Electric (Microsystems International Ltd.) Advanced Devices Center		not spec- ified		experiment terminated third year; only 25% of workers responded well to enriched environment	vertical loading; open system	Rosow (1974) Walton (1975)
Norway Footwear Manufacturer	assemblers	exp= 18 con- trol= 15	differences in amount of participation in decisions about scasonal change in production including a location of production articles, length of training division of labor job assignment	no difference between experi- mental and control groups in produc- tion; some weak support for effects of participation on attitudes	worker participation	French, Israel, 6 As (1960)
Ohio Dept. of Highways	skilled con- struction & electrical field workers	6 work crews		improved attitude; no change in productivity; in- creased absenteeis	loading	Powell & Schlacter (1971
Olivetti	machine operators parts workshop	160	responsibility for set up and inspection	improvement quality; decreased absenteeism; decreased indirect labor	horizontal	Davis, Cherns, & Associates (1975b) Chapter by Federico Butera
Olivetti	assemblers	spec- ified	subassembly of unite or modular assembly of entire unit; semi-autonomous work teams; respons: bility for inspection; in- creased feedback; apgrading and promotion of workers	increased train- ing costs; improved quality; increased i- labor costs; improved attitude	loading; horizontal loading;	Davis, Cherns, & Associates (1975b) Chapter by Prederico Butera
N.V. Phillips Holland Phase 1 1960-1965	assembly workers		oreak up assembly line of 104 workers into 5 shorter lines with buffer. stock; job rotation; responsibility for inspection	feedback; improved attitudes; little		Van Beck (1964) Organizational Dynamics (1973)

Name/Type Company	Type of Worker	N	Job Cha Change	Job Design Principle	Reference	
N.V. Phillips Phase II 1965-1968	assembly workers	eral .	bolition of foreman workers more autonomy	no improvement production	vertical loading	Organizational Dynamics (1973)
N.V. Phillips (Holland) Phase III 1968	assembly workers	entiro plant	groups; workers are responsible	lower production costs; improved quality of work; improved job satisfaction	vertical loading; autonomous work groups; worker participation	
N.V. Phillips Scotland	assembly workers	17 con-	bench assembly of entire unit; worker control over pace; worker responsible for quality	use of abilities;	horizontal loading; vertical loading	Donaldson (1975)
Phillips Ltd. United Kingdom	assembly workers (female)		assembly of elec- tro mechanical component changed to one worker assembling entire unit; responsi- bility for inspection	no improvement output or quality	vertical loading; horizontal loading	Kempner & Wild (1973)
Pittsburgh Plate Glass	fiberglass . plant Lexington, Kentucky	92	two man work teams; responsibility for operation clean- ing and set up; frame cleaners job eliminated; point system set up	increased productivity +12%; cost savings; absenteeism and turnover unchanged		Rush (1971)
Polaroid Corporation	factory operators	2000	job rotation; exposure to laboratory jobs	reduction in turnovers; reduced absenteeism; labor recruitment	job rotation	Foulkes (1969)
Power Plant	power plant employees accounting department	ers from 2	automated job en- riched plant; cen- tralization of maintenance; craft distinctions eliminated; EDP equipment accounting dept.	improvement in group cohesion; improvement in work attitude; some tension and anxiety in accounting dept.	vertical loading	Mann & Hoffman (1956, 1960) Mann & Williams (1962)
Precision Castmarts Corporation	machine casting	entiro plant	worker participa- tion in job re- design; elimina- tion of job rotation; increase freedom to set hours; increased responsibility and decreased supervision	increased oroduc- tivity; from \$110 hr to \$210 hr; reduction from 2 24% to .7%; improved morale; decreased absenteeism	vertical job loading; worker participation	Gooding (1972)
Proctor & Gamble	processing plants	2800	semi-autonomous work teams; worker participation through team meet- ings; removal time clocks; job rota- tion; increased feedback; all salaried plants	new plants 10 - 50% less overhead; improved quality	vertical loading; worker parti- cipation; open system	Gloser (1974) Fein (1974)

Name/Type Company	Type of Worker	N	Job Cha Change	nges Result	Job Design Principle	Reference
Saab Scania Sodertalje	auto engine plant	300	group assembly of entire engine; autonomous work teams; seven teams 4 workers; main- tenance, quality, included in assembly job; team decides work rate and assignments	improved quality; reduced oroduc- tioh speed; need more space	vertical loading; job rotation; autonomous; work groups	Organizational Dynamics (1973) Wild 1975 Davis, Cherns, & Associates (1975b) Tichy & Sandstrom (1974)
Shell (U.K.) Microwax Dept. Stanlow Refinery and Entire Company	chemical workers	not re- port- ed	introduction of group work teams with shift rota- tions and job rotations; removal of time clocks	increased output; decreased absenteeism	job rotation; vertical loading; autonomous work groups	Burden (1970) Hill (1971) Taylor (1972) Davis, Cherns, & Associates (1975b)
Sheltered workshop	handicapped individuals (sorters and packers)	48	horizontal loading of assembly, packing, and sort- ing tasks	no difference in quantity of out- put; decreased quality of work for excerimental group; differences between low and high status workers	horizontal, loading	Pishop & Hill (1971)
Sony (Japan)	electronics assembly workers	3300	honor system cafe- terias; increased autonomy (in regard to recreation & dormitory usage); work cells formed to determine pay standards, quality, training and safety related factors	not reported	vertical loading; increased autonomy and participation	Kobeyeshi (1969
State Institution Delinquent Boys	staff workers	39	change from custodial care to social learning rehabilitation approach; more responsibility; mor feedback; partici- pation in treat- ment; opportunity to learn behavior modification	higher ratings of job dimensions (autonomy, task identity feed- back, participa- e tion and infor- mation) on enriched jobs	vertical job leading: horizontal job leading	Reppucci, Dean, & Saunders (1975)
Swedish State Power Board	purchasing dept. buyers	not spec- ified	worker participation in change of work flow; distinction between specialized & general buyers eliminated: planning manager allocates work according to special skills; allows buyer to develop skills in one area; reduced supervision	not reported	change of organization structure	Taylor (1972)

Name/Type Company	Type of Worker	N	Job Cha Change	nges Result	Job Design Principle	Reference
Syntex Arapahoe Chemicals	scientists, managers, and non-exempt workers	125	chemists directly responsible for entire research project; semiautonomous work crews with lead man; elimination of foreman; worker participation; status differential eliminated	increased produc- tivity; improved attitude; faster service to customers; less voluntary turn- over	vertical loading; herizontal loading	Ruch (1970, 1971)
William Tatton & Co. U.K.	textile industry Mayfield Mill	apx. 450	semi-autonomous work teams with team captains; natural unit of work; responsi- bility for set up and work methods; worker particioa- tion in production meetings; reduction	not reported	vertical job loading; horizontal job loading	Taylor (1972)
	.5000000		of supervision	THE ELECTION AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADD		
Texas Instruments Attleboro, Mass.	entire plant	1500	every employee assumes responsi- bility for processing, planning, and con- trolling job fac- tors; group pro- blem solving with supervisor con- cerning job and environmental redesign	mixed results which seemed to follow an all- or-none battern (either very successful or failing quickly)	vertical loading plan-do-con- trol; work simpli- fication; worker participation	Roche & MacKinnon (1970)
Texas Instrument	fcmale electronic assemblers	601	added responsi- bility for work set up, work methods, materials, inspection, quality; increased feedback; group problem solving and goal setting; removal time clocks	improved attitudes increased productivity; decreased absenteeism and turnover	; vertica; loading plan-do- contro!	Foulkes (1960) Myers (1971)
Texas Instrument	janitors .	71	raised wages and benefits; improved cleaning equipment; weekly team mectings to set goals; increased accountability and feedback	improved cleanli- ness; decrease in number of personnel required cost savings; 91% decrease turn- over	vertical loading plan-do- ; control	Naher (1971) Chapter by Earl D. Weed Rush (1971)
Traveler's Insurance	keypunch operators	40- 42 exp. 58- 65 con- trol	experimental group was responsible for work schedules, correcting errors, & dealing with people requesting keypunching	increase in productivity; increased work quality; decreased absenteeism; improvement in work attitude	vertical loading	Travelers Insurance Co (1971) Hackman, Oldham, Janson, & Purdy (1974)
Travelers Insurance	accounting department	135	natural units of work; responsi- bility for correct- ing errors in accounts; super- visors concentrat- ed on training and supervision	errors, backlogs, complaints re- duced; 23% re- duction overtime; 20% improvement productivity; annual cost saving 100,000	vertical loading: horizontal loading	Randall (1972)

Name/Type Company	Type of Worker	N	Job Changes Change , Result		Job Design Principle	Reference
TRM	manufacturing plant	not spec- ified	semi-autonomous work teams schedule own work; worker participa- tion in job design and oroduction problems	increased productivity 15%	vertical job loading: organizational development	Business Week (1972a)
U.S. Air Force Ogden Air Logistics Center	civil service employees, mechanics, drivers, tape librarians	1000	47 projects natural work unit, responsibility for scheduling work, inspection, correcting defects direct feedback; relationship with specific clients	annual cost savings over 300,000 for 11 projects	vertical loading	Herzberg & Rafalko (1975)
U.S. Government (Washington & Baltimore)	internal revenue auditors, FCC engineers, socia security examiners	not re- port ed	expanded jobs to include more duties; elimina- tion of less de- manding tasks	improvement in service to public increased job satisfaction	vertical loading; job ourification	Pelisser (1965
U.S. Government (military installation	first-line supervisors	11	job expanded to include quality control; shift from man manage- ment to mechanical management	improved in work attitude	vertical loading	Davis & Valfer (1965)
U.S. Government	internal revenue service tax examiners	exp= 20 con- trol 24	direct contact examiner and edito of tax return; resconsibility for verifying own work; job rota- tion between editing and veri- fying; develoo skills in special areas; weekly unit meetings	in lower job rating (GS4&5) exp. group higher production and fewer errors; in higher job rating GS6 higher production con- trol group no different errors; no difference attitudes or motivation		Rush (1971)
Valley National Bank Phoenix, Arizona	check encoders and reconcilers	not spec- ified		Dita (Ber Empre) 28 setyal 12 set pro say Bogh 6	vertical job loading	Rush (1971)
Tolkswagen AG - Germany	automobile workers	tire in- dus- try	description of work council and rela- tionship with strong retalworking union; automation of routine functions; group subassembly of natural unit of work; responsi- bility for re- quisition of supplies materials and work schedules; account- bility for quality	levels of produc- tivity, good quality, lower costs	vertical loading; worker carticipation	Taylor (1972)
		\$ P.U.	can discard in- ferior material or work; reduction supervision; in- creased feedback			

Name/Type Company	Type of Worker	N ·	Job Cha Change	nges Result	Job Design Principle	Reference
Volvo Kalmar	auto assembly		autonomous work groups; group or team determines work rate; group selects foreman	new plant cost 10% more than con- ventional plant to build; data on production and other variables not evaluated as yet	vertical loading; autonemous work groups	Organizational Dynamice (1973) Skole (1975) Tichy & Sandatrom (1974)
	5 (5 ) 10 (6g)		SMAN STREET	21 (2) [3(14) [34 ] MCR.	60,000 1 44,90	100 354 44.7
Volvo Lundbyverxen	truck assembly	tota	autonomous produc- tion; work teams 5-12 workers; elect own super- visors; team schedules and dis- tributes work; group piecework rate; responsible for quality con- trol	lower turnover and absenteeism; quality improve- ment	vertical loading; autonomous work groups	Organizational Dynamics (1973
Volvo Torslanda	Car assembly	7000 work	job alternation (job rotation) every other hour or daily; multiple balance complete unit of work 20 minute cycle time	turnover down from 40% to 25%; absenteeism runnin higher; no im- provement produc- tion; quality improved	vertical	Organizational Dynamics (1973
Western Union	bookkeeping bureau, Philadelphia		natural unit of work rating and dbilling and ad- justment combined; revision of job classifications; union participa- tion in job changes	improved accuracy; decline in over- time by 20%; improved attitude	vertical job loading; horizontal .job loading	Maher (1971) Chapter by Frank P. Doyle
Western Union	New York . HQ office		worker participa- tion in organiza- d tional develop- ment; formation of trouble shoot- ing teams with authority to cross debt lines	some improvement in service; better supervisory; worker relation- shios	vertical fob loading; organizational devel	Maher (1971) Chapter by Frank P.Poyle Doyle
Western Union	instructors	not spec- ified	A STATE OF THE PARTY OF THE PAR	broke down super- visors resistance to changes in instructors jobs	organization development	Maher (1971) Chapter by Frank P. Doyle
Weyerhauser	paper manufacturing plant	300	"I am manager of my job" manpower develop ment; employee participation in work improvements; work groups determine daily production schedules, and individual job responsibilities	increased produc- tivity: improved attitude: fewer grievances	vertical job loading; iob and process improvement	Rush (1971)
Хегох	field technical representatives	90 exp. 300 con- trol	increased responsi- bility and author- ity to order parts and tools, request technical assis- tance; determined own schedules, territories and workloads; flexi- bility in work hours		vertical job loading	Davis, Cherns & Associates (1975b) Chapter by Carl D. Jacobs

of the product and securing of materials. This was called the Individual Job Design. Comparisons were made between 26 days of work at the old line job design, 14 days on the group job design, 16 days on the individual job design, and 27 more days on the individual job design. The average hourly output on the old line job design was used as a baseline stated as a productivity index of 100. Quality was measured in terms of 90% of defects per lot and averaged on the old line job 0.72% per lot.

Results indicated that under the group job design which involved elimination of the conveyor, the productivity index fell from 100 to 89 with defects falling from 0.72% to 0.49% defects per lot. After only six days on the individual job design, the average productivity index rose slightly above 100, and quality improved with defects falling from 0.72% to 0.18%. The author concluded that the individual job design was superior, as it resulted in a slight improvement in output, large improvement in quality, increased flexibility in the production process, increased indentification of individual differences in productivity and quality, reduced external service and control (e.g., inspection, material delivery), and more favorable worker attitudes.

#### Modular Assembly

Donaldson (1975) reports on a job enlargement study at Phillips involving female operators assembling electric fan heaters. The job enlargement consisted of moving away from an assembly line to a situation where one operator assembled, tested, and inspected the whole fan heater. In the new job design, the operator sat at a separate work bench, having all the tools at hand

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to complete the assembly and inspection. This enlarged group consisted of 17 operators. Comparisons were made with a group of 28 employees assembling another domestic appliance in the traditional assembly line method.

It was not a well controlled study since the enlarged group was more highly paid, considered to be better workers with higher levels of output, and of course, working on a product that was different from that of the so-called comparison group.

The enlarged group reported some positive new features, such as more use of their abilities, more variety in their work, and more visibility of their work to their supervisors. However, they also reported being more socially isolated, which they found to be a source of dissatisfaction, and some of the workers were dissatisfied with the pressure of the work. Of the 17 workers, 11 said they preferred the enlarged jobs, while the others expressed doubt about the enlarged job or said they did not prefer it. This study illustrates the fact that a job redesign can bring both positive and negative consequences. Although the results of job enlargement were mostly positive, the social isolation and greater accountability, in that the supervisor could trace back the product to the individual operator, were negative features of the job change. The comparison group used in this investigation is another example of the failure to use true experimental controls in field research design.

These results are similar to those found years ago by Conant and Kilbridge (1965). Progressive assembly lines were replaced by bench assembly of laundry machines. Results indi-

cated that work balance problems were eliminated, quality of production improved significantly, and assembly labor time costs were reduced, but comparisons on productivity between assembly and bench jobs could not be made. Workers preferred the enlarged bench job, particularly the self-pacing aspect. However, the authors state: "The responses to line work were considerably more negative, but we do not find workers as totally alienated toward line jobs as some commentaries in the literature have depicted them to be," (Conant & Kilbridge, 1965, p. 394). Social interaction was reduced in the enlarged bench job due to the distance between work stations. The study found that 40 workers preferred the enlarged bench job, and 19 preferred line work.

Kemper and Wild (1973) briefly note a job enrichment project at Phillips, Ltd., in which the assembly of an electromechanical component was changed from a line type to a single worker assembling the entire unit. The worker was given responsibility for inspection. Because of the small size of the sample, results could not be statistically validated, but no general improvements were obtained in output or quality. They concluded that "concepts such as job enrichment might be used with benefit as measured to counteract problems of job dissatisfaction, turnover, etc., in some but not all circumstances and for some, but not all, workers," (p. 65)

Other examples of changeovers from assembly line to modular production are reported by Tuggle (1969) and Wild (1975).

In 1974, the Kalmar Assembly Plant of Volvo opened, and it represented a radical departure in automobile assembly. A car carrier, which is an electrically powered platform which travels

about one mile per hour, transports a body, car frame, or assembled car around the plant to some 25 different working areas, each of which is staffed by a team of from 10 to 15 workers. The electric carrier's movements are computer controlled. Details of each car are stored in the computer. Cars move from one team to another, and each team is responsible for installing one complete system. Work teams divide up the work in any manner they prefer. Production totals 109 cars per day. Absenteeism and turnover rates are reported to be lower than those of traditional assembly line plants (Skole, 1975). The new plant cost 10% more to build than a comparable conventional auto assembly plant.

Saab-Scania of Sweden has also used group assembly of auto engines using seven teams of four workers each in a 30-minute cycle time to assemble the entire engine (Organizational Dynamics, 1973). An experiment on group assembly of an entire truck diesel engine involving 1500 parts was abandoned at the request of the workers who could not keep track of all the parts.

American automobile companies have gone on record expressing the view that assembly lines cannot be restructured and that modular assembly is impossible in view of the sheer quantity of production in the United States. Experimental projects by General Motors in team assembly have been discontinued (Business Week, 1972b).

#### IBM Inspectors

Many job enrichment projects have involved manipulation of the inspection function. Projects at IBM have been concerned

with this aspect of the work (Maher, 1971; Maher, Overbagh, Palmer, & Piersol, 1969). One project involved 70 employees who were engaged in inspection of parts manufactured in the plant (Machining Quality Assurance) or parts received from outside suppliers (Supplier Quality Assurance). The job consisted of inspecting parts on the floor or in a shipping area and either accepting or rejecting parts. The following changes were made in the Machining Quality Assurance function: step-by-step inspection was eliminated, a final inspection department was set up, a new position of Machining Quality Analyst was established which involved expanded duties such as prevention of poor quality, rather than merely accepting or rejecting a part. Similar changes were made in the Supplier Quality Assurance Department.

Short-range results after nine months indicated improved attitudes, slight improvement in acceptance rate of purchased parts, reduction in inspection time of 50%, and a decrease in the actual number of inspectors from 22 to 12 for supply inspection and 26 to 16 for in-plant inspection.

Follow-ups at one year and four and five years later found that the attitudes and performance of final inspectors had deteriorated somewhat from its high level. Additional responsibilities were then assigned to these inspectors to increase the enrichment level of the jobs.

In contrast to inspectors, the higher job rank of quality analysts did not show any decrement in performance over time. This is one of the few studies to include long-range follow-up.

## Shell U. K.--Production Workers

Because of production and morale problems, a complete reorganization of the micro-wax department at Shell's Stanlow refinery was undertaken. Before the reorganization, the plant consisted of four separate processing units and a control room. An operator's workload consisted of operating part of one unit or parts of two processing units. The reorganization began by assigning each operator to one complete operational unit including the control instrument panel. Operators were encouraged to move from one unit to the next when they became competent. Time clocks were removed, and workers could come and go providing they arranged relief cover with their senior operator's approval. Operating log sheets were revised to require calculations and entries once a day rather than every two hours. Senior operators were given authority to alter operating conditions. Workers participated in the design of equipment and changes in the production process. Workers were also given more responsibility for technical matters. Results of this reorganization indicated a decrease in absenteeism from 4.3% in 1963 to 3.3% in 1969. The figure was below the refinery total. In addition, this department had a high percentage of operators who were promoted to senior operators. Productivity increased due to both technical changes and improved work attitudes. Recently, the union negotiated a productivity deal which included more operator flexibility and continued elimination of the time clock (Davis, Cherns, & Associates, 1975b; Taylor, 1972).

#### General Electric--Production Workers

Sorcher and Meyer (1968) have studied production motivation at General Electric. Production motivation is conceptualized as attitudes or feelings about the work itself and the work environment. They have concluded that most factory workers are not aware of their personal role in the manufacturing process. They have developed programs of role training activities to increase an individual's conception of his work and the entire work process. These include group discussion meetings, tours of the plant, and group decision making in setting and meeting quality goals. Two areas participated in the research study. One area (A) contained eight work groups in which employees had a high amount of responsibility, discretion, variety, and physical movement in their jobs. Six work groups from Area B had typical low variety, assembly jobs.

Attitude or productive motivation increased in both groups after role playing. Employees' opinions of foremen went up, and in Area B, there was more improvement in overall attitude and in pride in their work. In both groups, quality of output improved after role training, and in Area B, there was a 20% increase in productivity resulting in a reduction of manufacturing costs. The group meetings produced many worthwhile suggestions for improvement in work methods.

## Imperial Chemical Industries--Research Technicians and Sales

Paul, Robertson, and Herzberg (1969) report on a controlled job enrichment project at Imperial Chemical Industries involving 40 laboratory technicians or experimental officers (EO's). These EO's are professionally trained personnel who implement scientific experimental programs. As a group, they felt frustrated by their limitation to routine implementation of projects. Two sections of a department acted as experimental groups ( $\underline{N}=15$ ), and two as control groups ( $\underline{N}=29$ ). It is reported that one experimental and one control group worked closely together on the same type of problem. The other two groups were separated geographically. It was also noted that six months after the program started, one of the control groups ( $\underline{N}=14$ ) was converted to an experimental group. The enrichment procedures consisted of EO's writing and signing final technical reports on projects to which they were assigned. EO's were also involved in planning projects and experiments. They were also given authority in financial and personnel training and selection areas.

Each month the EO's wrote progress reports on their work. These reports were assessed and scored on eight specifically defined criteria by three managers. The results indicated that after six months, the experimental groups surpassed the control groups in quality of their reports. A comparison of the enriched EO's research reports with scientists' reports indicated that the EO's mean score was 8.9, and the scientists' was 9.8 on a rating scale of 0 to 13. However, looking at another criteria of performance—staff assessment—it was found that only one experimental group showed consistent improvement over the enrichment trial. In looking at attitude data from a job reaction survey, it was found that the overall mean attitude score was not higher after enrichment than it had been initially.

In another controlled study of technical sales representatives, it was found that allowing sales representatives to eliminate sales reports on every call, to make direct settlements of up to \$250.00 on customer claims, and giving sales representatives 10% discretion on prices resulted in increased sales of 19% in an experimental group of 15 salesmen. A control group of 23 showed a 5% decrease in sales for the same period. The difference between the groups was statistically significant, p <.01.

Additional projects at Imperial Chemical Industries have involved design engineers and projection and engineering foremen (Paul & Robertson, 1970; Paul, Robertson, & Herzberg, 1969).

A T & T Studies

Early studies at A T & T used some form of experimental control (Ford, 1969a). In a study of 120 women in the A T & T Treasury Department who answer customer complaints, letters, and telephone calls, the women were divided into five groups: (1) achieving group,  $\underline{N}=20$ , vertical loading, (2) telephone group,  $\underline{N}=16$ , vertical loading, (3) control group,  $\underline{N}=20$ , (4) uncommitted group,  $\underline{N}=19$ , (5) uncommitted group,  $\underline{N}=20$ . In the control and uncommitted groups, first-line supervisors and employees were not aware of the study in the achieving and telephone group. Vertical job loading involved reduction of supervision, correspondents signed their own names to their letters, and there was less pressure on production but full accountability for work.

Results indicated that all groups showed improvement on a customer service index, but the achieving and telephone groups

showed greater improvement. Statistical comparisons between the groups were not presented. Initially, the achieving group showed a decrease in customer service during the period of readjustment to the enriched job and added responsibilities. Turnover in the experimental groups decreased, but stayed at the former level in the control and uncommitted groups. Absenteeism results showed only minor changes in long-term absences. Productivity differences were not reported. However, there could be cost reductions resulting from decreased turnover and reduction of personnel in the verification process. Promotion rates were higher for the achieving group and the telephone group, and their attitudes were reported to be better than the control groups.

Another detailed description of a job enrichment study involving framework allows for a critical evaluation of the experimental design (Ford, 1969a). Prior to job enrichment, 40 men were assigned to private installation work. These 40 men were divided into two groups: Group 1 wrote up the circuit and tested it; Group 2 actually installed the circuit or did the framework. The job was then referred back to Group 1 for testing. Problems developed in the coordination of the work and errors were reaching a prohibitive level. Supervisors could not identify the source of these errors and spent too much time scheduling, planning, and coordinating work between the two crews. The workmen also had established a "bogy" production standard.

Eight specific groups were involved in the study: four achieving groups (experimental total, N = 38) and four control

groups (total  $\underline{N}=45$ ). In the achievement group, teams of two or three workers were formed, and one member of the team was designated as the team leader. The team leader, with the help of the team, was responsible for the entire installation of the circuit from initial work through installation through turning over the circuit to the customer. Teams were given the freedom to establish work rate, pace, and method. They also were involved in inspection and correction functions.

Results were summarized as follows: frame errors declined, substantially more work was being completed on schedule, there was more continuity between teams, and there was substantial evidence on improved quality in new circuit installations.

Statistical comparisons are not reported between the experimental and control group on two measures—work units per man-hour and percent of work completed on schedule. Personal absences showed no significant change for either group during the study. In fact, the experimental group had a less favorable attendance record, but here again, statistical comparisons were not reported. Overtime for the achieving group declined during the period of the study, while in the control group, it increased.

Frame errors dropped from a high of 90 in February to 36 in May. It is not reported if these figures are for the achieving or control group or both.

Attitude data was collected by use of the "Reaction to Your Job Questionnaire." Due to union difficulties, only nine of the men in the achieving group (final  $\underline{N}=35$ ) and 21 of the 45 men in the control group completed the question. Results

are reported by the range of scores. In the achieving group, there was no significant change in the range of points scored from pre-test to post-test. In the control group, the range dropped 10 points. However, no formal union grievances were filed during the study, whereas before the study, they averaged one per week. It is also reported that the bogy production standard disappeared. In the night shift achieving group, enrichment was not implemented, and these men still adhered to the bogy.

In a series of other projects at A T & T, there were a total of 19 studies involving 1,000 experimental or achieving workers and an equal number of control workers. These workers were from a variety of jobs ( $\underline{N}$  = 9) and a variety of work units, locations, or departments (N = 10).

It was concluded that there were no trials in which the achieving or enriched group came off worse than a matched control group. It was reported that in only one trial was there no difference between the experimental and the control group.

The magnitude of results varied. Results in the Treasury Department and with eight service representative samples were impressive. Visible and consistent results were reported for accounting departments and modest gains in Traffic, Plant, and Engineering departments.

Lawler, Hackman, and Kaufman (1973) studied the effects of job enrichment in two core dimensions (variety and autonomy) involving 39 directory assistance telephone operators and 21 supervisors. They found that no change in motivation, job

involvement, or higher order need satisfaction occurred as a result of the job changes as determined by pre- and post-test scores. The job changes, however, did have a significant negative impact on interpersonal relations. After the change, older employees reported less satisfaction with the quality of their interpersonal relations, and those supervisors whose jobs were affected by the changes reported less job security and reduced interpersonal satisfaction. The implications of their findings were discussed in terms of the theoretical framework of job enrichment formulated by Hackman and Lawler (1971). The theory states that only workers who have strong higher order needs will respond to jobs that are higher on the job core dimensions. In addition, the jobs must be high on all four core dimensions-autonomy, task identity, variety, and feedback. Since the job changes did not involve all four dimensions, the authors concluded that the negative findings are consistent with the theory. General Foods--New Plant

During 1968, General Foods planned to construct an additional plant to manufacture Gaines Dog Food. Due to problems in other plants, management decided to incorporate many innovations in the new plant which represented a radical departure from traditional work organisations (Walton, 1972a, 1972b). The plant was built at Topeka, Kansas. The innovative features included autonomous work groups. The total work force of 70 employees were organized into six teams composed of from 7 to 14 members and a team leader who functioned like a coach or resource person rather than a boss. Teams were divided into processing teams and packaging teams. The team members assigned

tasks, coped with manufacturing problems, selected team members to serve on plant committees, and selected and screened new employees. The operating teams were responsible for production, maintenance, quality control, custodial and engineering functions. There was a single job classification for all operators, and pay was tied to the number of jobs a worker had mastered. For example, there were four basic pay rates: starting rate, single job rate for mastering the first job assignment, team rate for mastering all jobs within the team's jurisdiction, and plant rate for mastering all jobs. In addition, workers could qualify for specialty pay if they were skilled in a particular trade or craft. Pay has been a source of trouble in some cases, as pay was determined by the team leader. Another innovation was the removal of status symbols or differentiation between workers. There are no time clocks, and there are common parking lots and common entrances for both the office and the plant and salaried and hourly workers.

After 18 months of operation, the new plant's fixed overhead rate was 33% lower than in the old plant. Only 70 workers,
rather than the 110 estimated, were needed to staff the plant.
Annual savings of \$600.000 are reported to have resulted from
reductions in variable manufacturing costs (90% fewer quality
rejects and an absenteeism rate 9% below the industry norm). The
safety record is reported to be the best in the company, and
turnover is far below average.

Glaser (1974) reports that data as of March, 1974, indicates that cost savings now range from 20% to 40% greater than other

plants in the company or \$2,000,000 a year; rejects are 80% less than normal; absenteeism is 1%; turnover, about 10%, which compares to 15% for the parent company as a whole.

There have been a number of problems in the new plant, including workers who were unable to contribute or participate in this type of setting. Some team leaders could not shift from traditional supervisory roles to cooperative consultant-type roles. There was excessive group pressure for individual team members to conform to the standards of the group. Outside vendors resented dealing with workers rather than supervisors or managers.

Gomberg (1973) criticized this innovative plant as a "stacked experiment in a small plant with conditions set up and controlled to achieve a desired result," (p. 19). Gomberg reports that the selection ratio of employees at Topeka was 1 out of 10. He also reports that the new plant is always compared to an old plant located in Kankakee, Illinois, which employs 1200 employees. Gomberg feels that the Topeka case only proves that by turning your back on an old, big-city, rundown plant bursting with problems and building a small plant in Rural America, all your problems will disappear. Gomberg also notes that the Topeka plant is non-unionized.

Donnelly Mirrors is another small innovative company which has used semi-autonomous work groups; the entire work force is relaxed, and they participate in profit sharing in the form of a modified Scanlon Plan. This is an example of job redesign in a small family-owned business (Davis, Cherns, & Associates, 1975b; Gooding, 1970).

#### Federal and State Governments

A job enrichment project involving income tax examiners at the Statistics of Income Center showed the interaction of job level or complexity and job enrichment outcomes (Rush, 1971). These tax examiners randomly examine income tax returns filed by corporations to provide information on the economy for business and government purposes. The principle job of the tax examiner is editing and transcribing data from the returns and verifying the data recorded. All work is checked by another person in another unit. If an error is found, it is returned to a unit supervisor for correction. These employees are classified as GS-4, GS-5, and GS-6. This is the General Schedule (GS) for government employees. Generally, employees in the GS-6 jobs are paid more, have more work experience, and handle more complex tax returns.

The job enrichment project sample involved 28 GS-6 examiners divided into an experimental group ( $\underline{N}$  = 14) and a control group ( $\underline{N}$  = 14). A sample of 16 tax examiners ranked GS-4 and GS-5 were also divided into an experimental group ( $\underline{N}$  = 6) and a control group ( $\underline{N}$  = 10).

The job enrichment changes for the experimental group consisted of the following measures: direct contact between verifier and editor in reconciling errors rather than going through senior and supervisory personnel; every experimental unit verified its own work rather than sending it to another unit; job rotation in which each experimental examiner rotated from editing to verifying; editors became experts and specialized in certain industry returns, experimental examiners were given other short-

term projects; weekly unit meetings were held to discuss production, problems, and unusual returns; and improved training, which included pointing out the relationship of the individual job to the overall operation.

The experiment covered a six-month time span, during which job changes were introduced at a rate of one every two weeks. The results indicated that the experimental group of GS-4 and GS-5 examiners had higher production rates and lower error rates than the control group comparing performance at the end of the six-month period. There were no motivational or attitudinal differences between the groups. In the GS-6 sample, production rates were significantly higher for the control group, but there were no differences in error rates or motivation at the end of the six-month period.

It was reported that an increasingly complex workload accounted for the decline in productivity for both the GS-6 experimental and control groups over the six-month period. The lower productivity rate of the experimental group might be a function of job rotation. Experimental subjects rotated between editing and verifying and also were involved in additional projects. The difference in time on one job may have negatively influenced the productivity rate of the experimental group.

It was also inferred that the job changes were superficial and insignificant; the employees' involvement was low to begin with and that maintenance and hygiene factors were not adequately met. The small sample sizes severely limit generalization of these results, as does the large pre-experiment differences

between experimental and control groups on both production and error rates.

Other job enrichment projects involving Federal agencies and Civil Service Personnel are described by Pelisser (1965).

A job enlargement project at the Social Security Administration was undertaken with GS-11 and GS-10 disability claim examiners.

The job enlargement program attempted to merge two previously separate functions and jobs: disability medical review of applicants and claims authorization in terms of income, property, and financial matters.

After four months on the combined task, employees felt strained and could not retain all the rules and procedures associated with each function, and they achieved only 75% of the average production obtained when the two functions or jobs were performed separately.

These two cases indicate that complexity level must be taken into account in job enlargement or enrichment programs. Another example of the very same point is the modular assembly of units with a large number of parts. There may be too many parts to make modular assembly possible.

Herzberg and Rafalko (1975) report on a series of job enrichment projects at the Ogden Air Logistics Center at Hill Air
Force Base. A job enrichment program was begun in 1974. Eleven
separate projects were fully implemented within the first eight
months of the project. Then the number of projects was increased to 29, involving 1,000 employees in a wide variety of
jobs. Later, the number of projects was increased to 47. Four

of the first eleven projects are reported in the article. These four included enrichment for Avionic repairmen, sheet metal wing modification workers, and workers in a warehouse, in a distribution center, and in a magnetic tape library.

The sheet metal wing modification job involved attaching a steel strip to the bottom of the aircraft to increase the plane's maneuverability. Before job enrichment, the job involved 217 separate tasks. Work was scheduled by the foreman and checked by the foreman and a quality control officer. Defects were corrected by another mechanic. The job enrichment strategy involved combining the 217 separate tasks into one job for a four-member production crew with overlapping shifts. Mechanics began working directly with quality inspectors. Mechanics corrected their own defects. It is reported that after a few months of job enrichment, the enriched production crew surpassed the control group with estimated savings of more than \$89,000. Results are graphed, but details are not given. Enrichment with avionic mechanics involved combining maintenance functions with pilot testing. The problem resulted in \$85,000 savings in the repair of 47 planes. Test flights were reduced by an average of 1/2 flight per aircraft. In the supply and warehouse division, the warehouse drivers were given specific customers, allowed to schedule their own work, and given responsibility to maintain their own vehicles. Inspection of shipments was eliminated. Total yearly savings in personnel costs (elimination of inspectors) was \$37,900 per year. A survey of customers indicated 90% noted an improvement in service.

In the magnetic tape library, supervisors gave librarians more responsibility for customer orders, assigned them specific groups of tapes to manage, and provided feedback on errors. The results indicated that the number of lost tapes decreased from 9 to 1 per month, resulting in savings of \$4,216 in reconstructing tapes.

Annual savings for the first 11 projects were projected at \$377,900. Attitude surveys were de-emphasized. The authors conclude that implementation of job enrichment need not be time consuming. Each of the Air Center's five divisions named key men to be trained in job enrichment. The key men acted as internal consultants and coordinators. Supervisors implemented job enrichment projects in consultation with these key men.

A recent job design intervention has relevance for state institutions providing care or custody of mental patients, delinquents, prisoners, and others. Reppucci, Dean, and Saunders (1975) report on a study of 39 staff members of a state training school for delinquent boys. These staff members worked directly with the boys in one of six residential living centers or cottages. The school was in the process of changing over from an internally oriented custodial facility to a community oriented rehabilitation center based on a social learning model. All staff members under the new model were expected to take more responsibility, to receive more direct feedback on the quality of their work, to participate in developing the rehabilitation program, to learn methods of behavior change, and to participate actively in all aspects of the milieu treatment.

A modified version of the Hackman-Lawler Job Design

Inventory was used to measure the staff's attitude toward nine
job dimensions. At the time of the first administration of the
attitude scale, two experimental social learning cottages (SL)
had been ongoing for eight months, while four other cottages
were operating as benevolent custody units (BC). Fourteen months
later, after the four BC cottages were converted to SL cottages,
the job inventory was readministered.

The results confirmed the following four hypotheses: (1) at the time of the first job inventory, the two SL cottages scored significantly higher on job dimensions than the BC cottages, (2) there were no differences in the ratings of staff members of the SL cottages over time, (3) staff members of the BC cottages increased their job ratings after conversion to SL cottages, and (4) on the second job inventory, there were no differences in ratings between the original SL cottages and BC cottages.

The results indicated that the enriched jobs were significantly higher in autonomy, task identity, feedback, participation and information. Four job dimensions did not show a significant interaction effect on groups by time. These included variety, contact, informal contact, and learning. The authors do not report any data on the job performance of the staff, absenteeism, or turnover. However, they conclude that staff attitude and perception are important determinants of staff effectiveness.

Another job enrichment program in a clinical setting is a study by Bishop and Hill (1971) in a sheltered workshop.

# Clerical Employees--Decision Making

One of the more extensive field studies was conducted by Morse and Reimer (1956) where the primary aim was somewhat different from the traditional job design or redesign study. The study was formulated to increase the role in decision-making processes for clerical workers, while decreasing decision making for other departments in the organization. While not usually considered to be a job design study, the actual process and changes appear to fall within the purview of what could be considered now a job enrichment-type study. In the autonomy program, the authority was delegated to the lower levels in the organization, while in the hierarchy program the authority was given to the higher supervisory positions. In the autonomy program, the clerical work groups made the decisions concerning work methods and processes and personnel matters such as when breaks would be taken. One of the goals of the program was to increase self-actualization for those in the autonomy program. Looking at the four divisions separately, there was only one significant shift with self-actualization increasing in one of the two positions having the autonomy program. The self-actualization questionnaire dealt almost exclusively with job content, asking such questions as, "How much chance does your job give you to learn the things you are interested in?"

The major finding that job satisfaction per se did not show the expected significant changes was commented on in two different ways. First, it was suggested that the job content did

not really change, or second, that the increases in the complexity and variety of their total work were offset by a rise in level of aspiration. From the data, it is very difficult to tell what actually occurred in terms of jcb content, despite the fact that part of the manipulation was to allow the workers more discretion and an opportunity to change work content and processes.

The results of the Morse and Reimer study have to be considered somewhat tangential to the main theme of job design, but they are one of the first large scale organizational studies which focused upon the concept of attempting to increase self-actualization and moving the decision-making power lower down in the organization. As such, the techniques appear to be very similar to some advocates of job design. The results were not supportive of the increased decision making in influencing the actual satisfaction with the job itself or increasing productivity. Travelers Insurance--Keypunch Operators

Hackman, Oldham, Janson, and Purdy (1974) report on a job redesign project with keypunch operators at Travelers

Insurance Company. The job enrichment project included an experimental and control group of approximately equal size and job duties.

The following job changes were made in the experimental group: each keypunch operator was given responsibility for certain accounts and direct contact with these accounts, operators corrected their own errors and received weekly print-outs of errors and productivity, and operators scheduled and planned their own work.

The reported results were quite favorable with the number of operators declining from 98 to 60. The quantity of work showed an increase of nearly 40%, while the control group had an 8% increase during the trial period. The quality of work was also improved for the enriched jobs with the error rate dropping from 1.5% to 1%. Absenteeism also registered a 24% decline, while the control group rate increased by 29%. A corresponding change occurred in job attitudes. The experimental and control groups were approximately equivalent before the organizational change occurred; afterwards, the control group remained constant while the overall satisfaction in the experimental group increased by over 16%. Travelers estimated that the savings in dollars for the first year was over \$64,000 and that potential yearly savings were nearly \$92,000. This appears to be a good example of a very positive result from a job enrichment project based upon a specific theoretical framework of expectancy theory and higher order need strength described in Chapter III of this report.

## Bankers Trust--Typists, Clerks

Bankers Trust Company of New York has reported several successful job enrichment projects (Dettelback & Kraft, 1971; Kraft & Williams, 1975). In 1969, a project was undertaken to enrich the jobs of production typists in a &tock transfer department. There were a number of problems in this department, including low production, poor quality, high absenteeism and turnover, and poor attitudes. The changes involved allowing the production typists to change their own computer input tapes,

to handle a specific group of customers, to draw new stock certificates from a vault, to check and correct their own work, and to schedule their own work. Results indicated production rate increases ranging from 92% to 114%. The measure used was the number of completed transactions per hour by section. It was reported that by eliminating checkers for half of the typicts that a cost savings of \$300,000 annually would accrue.

Error rates did not increase among those typists whose checkers were removed. Attitude survey data from a Satisfaction with the Work Itself Scale (Ford & Borgatta, 1970) and interview data indicated significant improvement in attitude. It was reported that many supervisors had difficulty adjusting to their new roles, but through training, they adjusted.

Recent job design projects at Banker's Trust have involved deposit accounting departments (Kraft & Williams, 1975). Deposit account clerks, before job enrichment, functioned only as signature verifiers. They checked the signature on a check with signature cards, pulled mutilated checks, and filed the checks if the signature was verified. If the signature did not check, or if the check exceeded a specified dollar limit, the verifier passed it on to an operations specialist.

Job enrichment involved allowing the signature verifier to decide on paying problem checks without passing them on to an operations specialist. Phones were installed so that they could make inquiries to branch offices directly without going through supervisors. Feedback was improved in three ways: (1) closer identification with clients, (2) added duties allowing

for self-evaluation, and (3) a supervisors clerical appraisal system was developed.

Results of the project, which began in 1972 and ran for 18 months, indicated a 56% decrease per year in forgeries paid, a 19% decrease per year in misfiled items, and a 20-30% per month decrease in customer complaints. Staff level was reduced by 16% inspite of increased work loads, and the productivity index for the first half of 1973 was 110.1 compared to a target level of 98.5.

Similar changes were made in a business accounts section involving signature verifiers. Results indicated that error rates dropped from .65% to .53% in a comparable period. Staff level dropped allowing a 22% savings. The productivity index before job enrichment was 88.3%, and after it rose to 108.6%.

In the accounting control department, enrichment involved assigning work to clerks on a branch basis and establishing identification between clerks and branch clients. It is reported that increased clerical capacity and decreased absenteeism had the effect of adding 30 productive hours per month.

In addition to these benefits, turnover decreased. In conclusion, the projects resulted in tremendous reported cost savings as they allowed the bank to use existing human resources to expand business volume without the addition of more staff positions. The authors recommend a broader use of job enrichment and the application of job enrichment in the early stages of systems design.

## Other Banks--Typists, Clerks

Robert Janson reported on two controlled job enrichment projects at large financial institutions (Maher, 1971). The first project involved 34 auditing clerks. Prior to the enrichment project, the major job of the department was to control the cash flow of funds, and this was divided into three separate functions. An achievement or experimental group ( $\underline{N} = 18$ ) and a control group ( $\underline{N} = 16$ ) were set up. The enrichment procedures consisted of combining the three separate job functions, assigning clerks to specific companies, letting clerks decide if they wanted their work verified, and letting clerks handle difficult problems and deal with other departments. Results indicated that at the end of six months, the achieving group reduced a backlog of 700 errors to 100, while the control group continued with the same backlog of errors, approximately 650.

Turnover was 15% less in the achievement group compared to the control group. An attitude survey indicated that the achievement group mean increased 30 points on a 100-point scale from 50 to 80, while the control group mean decreased slightly. Management estimated that they would be able to handle about 10% more work due to the job changes. The author notes that only 3 out of the 18 workers in the experimental group had been trained to do all three separate job functions at the end of the six-month enrichment trials. Therefore, the superiority of the achieving group was not based on working at a natural unit of work. Details about the control group and statistical analyses of data were not reported.

The second study involved production typists who typed blocks of information on computer tapes. The following job changes were implemented for a group of 40 typists: they would correct their own mistakes, change their own computer tapes, be assigned to an entire company, some work would not be verified, and they would get direct feedback from a checker rather than from the supervisor. In a comparison with a control group of 40 typists, it was found that errors in the experimental group decreased from 15 to 20 a week to 5 per week. Production increased in the experimental group. Workers, prior to the project, had an informal production "bogy" of 70 to 80 blocks per hour. Attitude improved from 50 to 60 (out of a possible 100) in the experimental group and decreased from 50 to 47 in the control group.

## Expectancy Effects and Job Redesign

King (1974), in one of the few field studies to investigate the phenomena of expectancies upon organizational change, found that these expectancy effects were more powerful than the job redesign approach. More than one plant was used in King's experiment. In one plant, the managers were informed that job enlargement would result in increased output, while in a second matched plant, they were told that job enlargement would not result in productivity increases but would improve the industrial relations aspect. In a job rotation change, the same format was followed with one plant management being informed that job rotation would result in increased output; and in the other plant, this organizational change would result in improved industrial

relations but not in improved productivity. Results from the four plants clearly show that these expectations had more of an effect upon actual production than the nature of the innovations themselves.

In other words, the plants who were told that increased output would result, either as a function of the job enrichment condition or the job rotation manipulation, did have increased productivity, while those plants who were told that there would be no change in production had lower productivity figures. The change in the attitudes of both managers and employees, indicated that where expectations favored changes in productivity as a result of the change program, there was a positive significant difference between the plants with the expectations compared with those without the expectations. It seems clear from the data that the expectations that the managers held about the change program had been communicated in a positive fashion to the employees. This extended not only to the expectations of the employees about the effects of job enlargement but also to their evaluation of the effects.

The findings of King (1974) are similar to the results obtained by Barrett, O'Connor, Alexander, Forbes, and Balascoe (1975). A laboratory study found that the expectations concerning job structural attributes could be psychologically manipulated. As a function of these expectations and manipulations, there was a difference in terms of the relationship between certain ability measures and performance and in the discrepancy between the preferences individuals held before

beginning the task and their descriptions of the task after it was completed.

## Job Design Failures or Negative Consequences

Alderfer (1967) 1969) found that job complexity was positively related to satisfaction with the use of skills and abilities. In a more detailed comparison of machine operators with enlarged jobs and those with traditional jobs, it was found that there was greater satisfaction with the use of skills and abilities and with pay for those with the enlarged jobs. But for satisfaction with respect from superiors, it was significantly lower for those having enlarged jobs. This was not a tightly controlled field study in the sense that there was no real assignment of individuals to enlarged jobs, and there was a very high positive relationship between education and job complexity. It is interesting to note that this study shows that there are potential trade-offs, at least in one organization, when one moves from a repetitive to a more enlarged job. While one gains satisfaction with the better use of his skills and abilities, he may lose satisfaction with the respect shown to them by their supervisor.

Mann and Williams (1962) report that a changeover to electronic data processing in the accounting department of a large electric power company did result in more interesting and challenging jobs for individuals but also in greater exposure to risk and tighter performance standards. Workers also worried about the possibilities of layoffs or losing their jobs.

It would appear that while the increased job content and general job enlargement had many positive features, it also exposed the employees to higher performance standards, more accountability, and the expectations of more from the employees than before the changeover.

# Industrial Job Redesign Failures--Electronic Industry

Non Linear Systems, in the early 1960's, instituted group production and other far-reaching job design changes (Kuriloff, 1963). It is one of the few examples of a company abandoning group production and returning to conventional production systems (Rosow, 1974). It is reported that revenues dropped from \$6 million in 1965 to \$3.5 million in 1971. There are arguments as to whether the decline was caused by a general downturn in the aerospace industry or the job design innovations. The president of the company blamed the experiment.

Northern Electric Company Advanced Devices Center built a new semi-conductor plant in Canada. The plant was layed out to facilitate work and communication. The organization of the company was patterned after a matrix of functional teams. Traditional titles and authority relationships were eliminated. The experiment was terminated in the third year, and it is reported that only 25% of this professional technical work force responded well to this type of open system (Rosow, 1974; Walton, 1975).

Frank and Hackman (1973) published the first case of a total job enrichment failure. The job enrichment project took place in the stock transfer department of a large metropolitan

bank. The change involved 28 employees out of 300 who worked in six central jobs in the department. The 28 employees had a mean age of 33, they were 85% female, and their modal educational level was a high school degree. These 28 employees were involved in six central functions of transferring ownership of stock securities: preparation clerk, process, operator, legel clerk, correction clerk, and typist. The basic enrichment plan was to create 10 to 13 semi-autonomous work modules within the department, each of which would be a miniature stock transfer department. Each module would have its own work coordinator. Every worker in the module was to learn and eventually perform every function. Specific sets of corporations were to be assigned to each module, and knowledge of results of work activities were to be increased by the continuous presence of a correction clerk, pairing of inexperienced and experienced workers, and weekly computer reports.

Prior to the job changes, data were obtained by use of the Job Diagnostic Survey (JDS). This included workers, supervisors, and expert ratings of the jobs on five core dimensions, general and specific satisfaction of the workers, and internal work motivation. Behavioral measures consisted of supervisors' ratings of the amount of effort expended on the job, work quantity, and work quality. Absenteeism records were obtained for the previous year.

Five sets of data were obtained from the following groups: (1) employees in Module 1 after the change, N = 11, (October),

- (2) employees in Module 2 prior to job change, N = 9, (October),
- (3) employees in Module 1, long-term follow-up (March), (4) employees in Module 2 after the change, and (5) employees working under the old system, N = 8.

The results suggested that the change to work modules had almost no impact on the characteristics of the job. The statistically significant results obtained were in the wrong direction; the job tended to get worse rather than better after the change to work modules. For example, Module 2 employees experienced less task identity after the change to work modules. Employees working under the old system rated their jobs significantly higher, than did workers in enriched jobs, on three measures: skill variety, feedback from the job, and dealing with others. Similar findings occurred in the area of general and specific affective responses or satisfaction.

The authors note that in reality, the jobs themselves changed very little as the computer feedback system was not implemented, and training of all workers in all jobs was not completed. Other problems involved malfunctions in the computerized aspects of the work, the Christmas holiday with increased work loads, and a change in personnel at the top management level. For a variety of reasons, a number of changes in the five core job dimensions had not been initiated or they did not work. For example, in the area of autonomy, members of management continued to intervene in the so-called semi-autonomous work groups if there was a work crisis. The authors concluded that the failure occurred through problems in implementation, rather than problems in the theory.

## Methodological Problems

These field and case studies point to a number of methodological problems and the conceptual confusion which surrounds job enrichment.

A review article on job redesign projects in Europe (Organizational Dynamics, 1973) concluded that there has been only anecdotal evidence on the impact of job redesign on quality, output, absenteeism, and turnover. However, the article states that since this anecdotal evidence indicates that management has achieved at least an economic draw from its efforts of job redesign, job redesign serves as a measure of insurance against an uncertain future in which employee demands and expectations will become difficult to fulfill.

Kempner and Wild (1973) state that the problems of job design are complex and multivariate; and consequently, principles or procedures for job design are more appropriately pursued in specific circumstances.

Luthans and Reif (1974) and Reif, Ferrazzi, and Evans (1974), in a survey of companies engaged in job enrichment, found a number of problems in these projects including workers' reluctance to accept additional authority and responsibility, and difficulty in adjusting to changes in job content and self-supervision. They concluded that companies do not prepare or train workers for enriched jobs. Their survey indicates that the majority of firms practicing job enrichment have a limited understanding of the concept and that this lack of knowledge has impeded progress in the field. They concluded that the principle

reasons for the slow diffussion of job enrichment is that many companies do not believe that this technique will be economically sound or profitable and that the psychological benefits have been grossly overexaggerated.

Blackler and Brown (1975) have summarized many of the critical reactions to job redesign. They point out the confusion in terminology which exists in the field and the fact that this may impede both the practical and theoretical aspects of job redesign. They contend that the research designs, in general, have been weak and have been confounded by extraneous variables. They call for the establishment of new models of human potential with the job design practices expressed in psychological terms, not exclusively upon the models and value systems of management. They state that:

If this general conceptual approach is accepted, it has clear implications for the nature of empirical equity. If job design attempts to affect the personal development of people and hence their life styles, then to evaluate its effectiveness in terms of traditional managerial criteria is inappropriate. (p. 191)

They conclude that job design is too vital and important an issue to go the way of other management fads.

Other researchers have pointed to methodological problems in job enrichment. Swain (1973) noted that like any new approaches, there will be "some rather soft-headed attempts at application," (p. 134).

King's (1974) study indicates the effects of expectancies on job redesign.

In summary, the methodological problems in field studies have been conceptualized as internal and external threats to validity (Campbell, 1957). Internal threats to validity refer to factors inherent in the experimental design which interfere with the experimental inference of cause and effect relations. These include inadequate or nonexistent experimental control, sampling problems, measurement problems, and inadequate or inappropriate statistical analysis. External threats to validity include problems in generalization from a specific set of circumstances in the research to workers or companies as a whole. The job design field is glutted not only with ill-defined concepts and terms but with applications and research that do not meet acceptable scientific standards. This review of field and case studies in job design demonstrates the lack of research sophistication and control.

#### Summary Statements

- (1) Worker reaction to technological change is a function of a number of variables including job security, worker participation in the change, changes in social interaction patterns, training, stress and pressure, and individual personality and ability variables.
- (2) Increased automation sometimes results in tension over job security, disruption of social interaction patterns and group cohesion, reduced control over work pace, and loss of work autonomy.
- (3) Assembly lines should ideally be short, single product lines with buffer stock.

- (4) Mechanical pacing, which is a disliked feature of assembly line work, is a source of satisfaction to some workers as it provides rhythm and traction.
- (5) Work speed does not involve a general factor, but each individual worker adopts a certain speed or tempo for a particular activity. A faster work pace may result in less response variance.
- (6) Optimal batch size is a function of product characteristics and skill level of the worker; in production of small objects, batches of 1-1/2 hours are desirable.
- (7) Modular assembly of an entire unit or subunit adds to the meaningfulness of work.
- (8) Task variety is a function of batch size, actual number of tasks performed, and work discretion.
- (9) Boredom and monotony are as dependent on individual attributes as objective task characteristics.
- (10) Young, extroverted, emotionally labile workers, restless in daily activities, are more susceptible to boredom.
- (11) The best observational predictor of monotony is task repetition.
- (12) Inspection for quality control can derive and use principles from signal detection theory.
- (13) Field and case studies of job enrichment have not used acceptable experimental designs, controls, statistical measurement, or long term follow-up. The evidence is more anecdotal than scientific.

#### CHAPTER VI

#### JOB DESIGN STUDIES IN THE LABORATORY

There are only a relatively small number of studies which have attempted to experimentally manipulate the variables important in job design. Because of the limited number of studies specifically designed to deal with job design issues, other selected laboratory studies will also be reviewed which appear to be relevant to job design issues.

This chapter will review the following types of laboratory studies: (1) job restructuring involving job enrichment simulations and redesign of inspection-type tasks; (2) job factors including work pace, repetitive jobs, organizational structure and work groups, and knowledge of results; (3) cognitive and motivational factors including ability, intrinsic-extrinsic rewards and motivational states.

The studies reviewed in this chapter, along with other representative studies, are presented in Table 4, Laboratory Studies Related to Job Design, which is arranged to follow the order of the topics covered in this chapter.

#### Job Restructuring

#### Enrichment of Task Content and Discretion

Maher (1971) conducted three separate experiments to test the hypothesis that the content of the job and discretion in work method account for the observed increases in performance and satisfaction obtained in field studies of job enrichment. The subjects were males between the ages of 17 and 26 who were recruited for

Table 4

Laboratory Studies Related to Job Design

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Job Redesign	Simulated mon- itoring task	College students	60 (Male & Female)	Individuals with most specific ability for performing task derive less satisfaction. Task characteristics (high or low) moderated relationships ability, performance preferences, and satisfaction.	Barrett, Forbes Alexander, O'Connor, & Balascoe (1975)
Job Redesign	Simulated main- tenance task	College students	60 (Male & Pemale)	Psychologically manipulated levels of responsibility, feedback, and learning new skills demonstrated strong expectancy effect upon ability, task performance, and satisfaction.	Barrett, O'Connor, Alexander, Forbes, & Balascoe (1975)
Job Redesign	Simulation of aircraft control and warning cen- ter	Not identified three-man groups	Not Specified	In high load condition per- formance improved with practice; in low load con- dition converse true. Non sign. trend that vertical structure (functional di- vision of activities) was superior under high load conditions and horizontal structure (whole task) was superior under low load conditions. However, interaction between load and structure not signifi- cant.	Lanzetta & Roby (1956)
Job Redesign .	Assembly of electrical extension chord	College students age 17-26. Males		Exp. 1 Job Enrichment All subjects worked on low content (assembly line) low discretion (follow written instructions) for 2 days, then content, discretion or both or none were enriched. High content (individual modular assembly) high discretion (flexibility in following instructions) had highest performance.	
Cther Aldry Low Value	case (ease	ne of tests test is acre test is acre test compens	Exp. 2 not re- ported 39? Exp. 3 not re- ported 25?	Exp. 2 No Job Change Low content high discretion group had highest produc- tivity. Exp. 3 Job Shrinkage Group which lost discretion and content had lowest per- formance. Satisfaction data was curvilinear. Subjects in most enriched and least en- riched were most dissat- isfied.	griga buda 9 30 makso
Job Redesign	Computer coding	College students	(14 ex- trinsics 46 in-		Robey (1974)
Job Redesign	Coding	College students	72 Males	Low task flow and competitive differential reward yields greater productivity than high task flow and equal reward. Ability interacted with task flow and reward conditions.	Weinstein & Holzbach (1973)
Job Factors- Type of Tasks	Review of series of studies in small group lab- oratory			Attitude change involves type of task and degree of control of task situation.	Breer & Locke (1965)

Maden Banka	Type of Task	Cample	N	Major Results	Reference
Major Topic	or Study	Sample	40	Vigilance performance not	Baker & Ware
Job Factors- Type of Tasks	Simple vigilance bean sorting simle assembly addition	Army trainees	40	related to other three tasks. Two unique aspects of vigilance are lack of automaticity and inability of individual to control work rate.	(1966)
Job Factors- Type of Task	Problem solving	College students	16 women	group compared to increas- ing or decreasing complexity groups. Some trend random order lower boredom scores. Uncertainty beneficial to task efficiency and sat- isfaction.	
Job Factors- Type of Task	Production, Discussion, and Problem Solving	Three-man Groups	108 groups	Task type determined up to 50% of variance of products. Task difficulty was related to products but not task order.	
Job Factors- Type of Task	Production, discussion, problem solving	Three-man groups	108 groups males	Task type affected 60% of group activity. Production and discussion were least alike in terms of group interaction. Easy tasks tende to accentuate effects due to task type but task difficulty had less effect on group activity.	Morris (1966) d
Job Factors- Task Complexity	Review of studies on complexity	Nine studies	617 adults & chil- dren	There is an intermediate amount of variability which is preferred. Preferences change with experience and are related to an individ- uals ability to process variability.	Munsinger & Kessen (1964)
Job Factors- Work Pace	Simulated in- spection of print ed circuits	Women	20	Self paced subjects per- formed better but took longer than machine paced. Self-paced Ss rated task, as more controllable, in- teresting and important. But both groups rated task as unpleasant.	McFarling & Heimstra (1975)
Job Factors- Work Pace	Arithmetic	College students	Work Pace = 17 males 14 fe- males elf pace 18 males 10 fe- males	Mean response time self pace longer than work pace No difference in performance self pace vs. work pace. Work pace resulted in less variance (more consistency). Mean response rate cor-	
Job Factors- Work Pace	Motor and other tests, (tapping, writing, speed of walking)	College students	91 Males	Each S seems to adopt a cer- tain temporal pattern for a particular group of activi- ties and this defines, per- sonal tempo. It does not appear to be a general fac- tor across all tasks.	
Job Factors- Work Pace	Marble sorting assembly task card sorting writing	Exp. 1 assemblers Exp. 2 office workers	Females 10 Males 15 Females	Strong relationship found between a subjects estimate of how long it took them to sort marbles and cards (goal estimate) and sub- sequent actual task perfor- mance on another task at	
Job Factors Work Pace	Arm swing device	College students	75 Males 75 Females	which they are proficient. Individuals have preferred tempos of voluntary move- ment. No sex differences found in either preferred tempo or consistency of per formance.	Smoll (1973, 1975a)
Job Factors- Work Pace	Arm swing device	College students	150	Subjects who were faster in tempo were more consistent from response to response than were subjects who were slower.	

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Job Factors- Work Pace	Inspection of plastic discs	College students	8 Females	Inspector paced displays compared to external paced displays are more beneficial when rapid scanning is required, inspector paced displays yielded more defect detections and fewer false alarms. Display arrangement (random versus ordered)	Williges b Streeter (1971)
Job Factors- Work Pace	Assembly and in-	Workers	40	Discrepancies between perceived work rate and above normal work rate were associated with fatigue. While discrepancies below normal were associated with boredom. Perceived work rate	Wollack (1969)
Job Factors- Time of Day	Repetitive tasks (vigilance, reac-	Naval men	. 25-30	was only moderately re- lated to actual work rate. Consistent trend for im- provement in performance	Blake (1967)
	tion time, digit span, etc.) re- peated 5 times		•	from 8:00 A.M9:00 P.M. associated with rise in body temperature and arous- al. Digit span deterio- rated.	Wi to Anti-
Job Factors- Training	Assembly tasks	13 Experiments	8 - 64	The best instructional media is pictorial. The worst is written instructions. Slide-booklet approach has the highest benefit cost ratio.	Konz & Dickey (1969)
Job Factors- Environment	Series of tests (Watson Glaser, Minnésota Clerica Test, etc.)	College students	72 Males & Females	The visual environment (aesthetic appeal, organization and phenomonological size of room) had no effect on task performance or mood of subjects.	Krieger (1972)
Boredom	Repetitive task and post hypnotic suggestion	College students	4 Males	Boredom is associated with low arousal, unpleasant- ness, constraint, and re- petitiveness. Lowered arousal seems to be most critical.	Geiwitz (1966)
Boredom Arcusal	Repetitive work 3½ hr. shifts- 10 weeks Vigilance tasks	Not specified	5 21	Ss can manipulate their arousal levels independent of experimental variables (alcohol and caffine). Auto-arousal can produce "damping down" which causes fatigue and decrement in performance.	Murrell (1967, 1969)
Boredom Arousal	Testing electrica components	Women	4 Females 2 Females	Rate of work not related to blood sugar level but ex- pectation, effect of drink- ing glucose.	Murrell (1971)
Boredom	Assembly tasks	Three-man teams	72 Males- 24 teams	Teams were more productive on tasks of sufficient complexity which reduced boredom. Changes in time pressure effected production in curvilinear fashion Task complexity and time pressure did not significantly interact.	Pepinsky, Pepinsky, & Pavli (1960)
Boredom	Review of research patterns of daydreaming, information processing & daydreaming, physiological correlate aroused emotion, implications	s.		Daydreaming maintains varied stimulation and arousal and may improve task performance. Even in complex tasks there is stimulus independent thought.	Singer (1974)
Boredom	Visual choice reaction task	College students	25 Males	Performance was most ef- fective at medium arousal level. Bicycle ergometer used to vary arousal level.	Sjoberg (1968)

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Boredon	Review of research		, n	Young workers with strong	Stagner (1975)
BOLEGOW	Neview of research			autonomic nervous system	
				arousal, sensation seeking,	
				anxious individuals, ex-	
				traverts, will most likely	
				rebel against assembly	
				line production. High ego	
				strength, authoritarian,	
	466 463 23450			restricted theta activity	
				will respond well to as-	
				sembly line jobs.	
Inspection	Simulated in-	College students	4 Males	Detections of defective	Badalamente &
	spection task		1	circuits serve as reinforce	- Ayoub (1965)
				ments for observing re-	
				sponses. Decrement in per-	
	Comment of the state of the	the late of the same of the same of		formance is associated with	
				differential schedules of	
				reinforcement. Presenta-	
				tion of a high rate of	
				signals prevents decrement	
				both in terms of missed	
				signals and false alarms.	
				Variable reinforcement	
	1			is superior to other	
	111111	Callery - 1	1 22	schedules.	Bell &
Inspection		College students	80	Performance was affected	
	displays			by stimulus density (in-	Symington (1974)
	Section 1			crease in errors-high	
				density) boundaries of	
				stimulus array (shorter	
				detection times-wider	
				boundary) but viewing dis-	
				tance was not a factor.	<del></del>
			L .	As more time is allowed	Drury (1975)
Inspection	Visual inspection	Series of studie			1
	task		enced in-		
			spectors	items decrease while errors	Addison (1973)
			4-9	of rejecting good items	
				increase, Rapid KR in-	
			-	creased performance.	Fox &
Inspection	Inspection of	Inspectors	10 Fe-	Increasing the probability	
	Screws		Males	of a defect increases num-	Haslegrave
				ber of false detections.	(1969)
	The second second			A probability effect was	
				found for unpaced condition	
				Raising the probability	
		* · · · · · · · · · · · · · · · · · · ·		increased level of detec-	The state of the s
				tion of defects.	
Inspection	Simulated inspec-	Not identified	96	Greatest accuracy achieved	
	tion task		Females	on inspecting material	Weightman,&
				from 3 lines of 6 line con-	Browne (1975)
				veyor sitting opposite	
				another inspector doing	
				same job. When working	
				alone performance on 3 line	
				superior to 1 line.	
Inspection	Auditory inspec-	Naval	96	Determined optimal load	Poulton (1960)
	tion		Males	from four levels of load	
				and three rates of critical	
				signals. If load is too	
				great fatigue occurs. Lord	
				too small results in	
				boredom.	
	-		1	Loredom.	
Inspection	Review literature	The second second		53 studies of vigilance	Poulton (1973)
spec cron	Seview Interacting		1	related to factory inspec-	1.501.001, (1.973)
•			A	tion. Studies are reviewed and tabled.	
Inspection	Series of experi-	Inenectors	5-9	Knowledge of results, re-	Schoonard &
anspection	ments inspection	Tuebeccora	women	stricting field of vision,	Gould (1973)
			women		
	of circuits or chips			increasing visual scan in-	
	chips			terval did not improve in-	a miller (1973
			1	spection. Most accurate	E STATE OF THE STA
				inspectors were the fast-	
				est and made fewest eye	
				fixations. Removing un-	
	TO THE PARTY OF THE PARTY OF			certainty as to whether	
				target is present did not	
				aid inspection but warrants	
				further study.	A1
Inspection	Moving display	Engineering	12	Sign. less time required to	Simon (1965)
	versus static dis	-personnel		find target on moving dis-	
	play			play. Time difference in-	
			1	creased as targets became	
				more difficult. There was	
			1 . 1	no sign. difference in num-	
				ber of real or fake tar-	2
				gets acquired.	
				130ca acquired.	

76	Type of Task				
Major Topic	or Study	Sample	N	Major Results	Roference
Inspection	Vigilance task visual monitoring	Army trainees	112	Group treated in democratimanner showed higher level of detection performance on all three stimulation conditions (no stimulation contingent on detection and non-contingent stimulation) Performance under contingent superior to no stimulation. Contingent condition showed no performance decrement.	& Baker (1964)
Group Factors	Creative task (plan a dormitory and community)  Make and serve coffee	College students	safety- low es- teem males 25 high esteem low safe-	Safety goups established hierarchial social structures.  Groups organize themselves in ways compatible with motivations of members.	Aronoff & Messé (1971)
Group Factors	Business- game	Graduate students	108	Division of labor form of organization superior to committee and hierarchial organization. Organizational structure has greater influence on rates of learning when initial performance is low.	Becker & Baloff (1969)
Group Factors	Assembly of boxes	College students	Exp. 1 60 males Exp. 2 32 males	Sign. better performance in high dependency condition where is were told peer supervisor would be evaluated by their performance. Low dependency Ss worked harder when told supervisor would learn immediately about productivity. This factor did not affect high dependency Ss.	Berkowitz & Daniels (1963)
Group Factors	Complex problem solving	College students	84 Males	Eventually three different organizational structures reach same level of performance. Loose oral struture was more satisfying than loose written or tight (no face to face interaction)	Carzo (1963)
Group Factors	Report on series of studies on problem solving in groups.			Proposes three main concepts to explain and study group problem solving.  (1) Interdependence-degree to which decisions made by one or more members affect the alternatives of other members. (2) Coordination is the operation of the control function in group problem solving. (3) Group centrality-a group structur is central to the extent that a specialization among group members has taken place. A hierarchial group structure exists when a goal emitted by some member to another is a sub goal received from a third.	
Group Factors	Simulated job re- viewing credit applications	College students	120 Males & Females	a third.  Climate and power percentions not strongly related.  Level of participation in decision making main contributor to power percentions. Customer orientation main contributor to climate. Customer orientation with participative decision making leads to post	Dieterly & Schneider (1974)

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Group Factors	Review research			No general theory of group effectiveness has appeared Key to understanding group is in on-going interaction process as group works on task.	Hackman & Morris (1975)
Group Factors	Assembly of elec- trical components	College students	144 Male	In one task condition equal information was provided to each group member, in anoth	Brousseau (1974)
				er it was spread unequally requiring exchange of information. In unequal condition an intervention inducing explicit discussion enhanced group effectiveness. Opposite intervention worked in equal group.	
				Control groups did not dis- cuss strategy.	
Group Factors	Simulated radar control	College students	64 Male	Under high load condition fewer errors occured in compensatory teams than in noncompensatory teams.  Team communication hindered performance in noncompensatory high load condition.	Johnston & Briggs (1968)
Group Factors	Human relation problems	Four person mixed sex dyads	108 Male & Female	Groups in which attention was paid to interpersonal relations (adaptive) performed worse than groups who suppressed interpersonal relations (traditional) Adaptive groups had more favorable task experience.	Kaplan (1973)
Group Factors	Finding common symbol on card	College students Five-men groups	100	Wheel pattern faster solution than circle. Circle pattern used more messages to solve problems. More errors made in circle. Circle members enjoyed task more than wheel, then chain then wheel. Circle is active, leaderless unorganized and enjoyed. Wheel is less active has distinct leader, organized and unsatisfying.	Leavitt (1951)
Group Factors	Problem solving	College students three-person groups	64 Groups	Higher total amount of con- trol and more equally group members share control over decision making better the performance and higher the satisfaction.	Levine (1973)
Group Factors	Creative task	College students triads one male & two females differ- ing in safety or esteem needs	48 Females 24 Males	Males became leaders more often in safety groups than esteem groups. Leadership and task competence relationship higher in esteem groups. Seating position of male interacted with motive	£
Group Factors	Review of research effects groups co- operation and com- petition and expe- study	Male	90	Under high task interdependence a strong negative r found between productivity and differential reward. Under low task interdependence positive relationship between productivity and differential reward is weak. Two theories (1) differential reward encourages maximum individual productivity (2) differential reward leads individuals to block	Miller & Hamblin (1963)
Group Factors	Multiple cue in- ference task	College students	240 Females	productivity of group members.  Task structure and task organization but not work structure affected per-	Naylor & Dickinson (1969)
				formance. More structured task higher achievement; high task organization decrement in achievment.	

AKRON UNIV OHIO DEPT OF PSYCHOLOGY
THE RELATIONSHIP BETWEEN INDIVIDUAL ATTRIBUTES AND JOB DESIGN: --ETC(U)
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Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Group Factors	Cooperative study		136	Ss with large shares in	Shaw (1960)
	task-writing ab- stracts of arti- cles	(Female)	Females	group task showed higher task motivation. Identifi- ability of individual con- tribution was not in this study sign. related to task motivation but result	
nor consultation of the co			resident.	may reflect inadequacy of experimental manipulation of identifiability.	- 1×0
Group Factors	Difficult and	College students	144	On both easy and difficult	Shiflett (1972)
	easy crossword puzzles		Males	tasks, free choice and di- vided labor were more ef- ficient than shared labor. Shared labor higher satis- faction, divided labor low- est satisfaction.	
Group Factors	Review of labor- atory experiments on group produc- tivity	20 (10 (10 (10 (10 (10 (10 (10 (10 (10 (1		Three determinants of group productivity are task demands, resources and group process. Tasks are classified as disjunc- tive (product is group out-	Steiner (1972)
reu poes				come) conjunctive (quality determined by worse group member) additive (success depends on sum of individual effort) and discretionary (members combine contributions).	AND THE TOTAL
Group Factors	Simulated radar control intercept task	College students	64 Males	Verbal communication when not required by task plays insignificant role in teamwork. Team performance best in verbal-visual condition where communication was unnecessary. Verbal communication facilitates	Williges, Johnsto & Briggs (1966)
Knowledge of re- sults- goal set- ting	Keypunching	College students	16 Males	performance only when a more efficient information channel is not available.  No sign.difference in performance in Group 1 (no KR), Group 2 & 3 (immediate KR & goal setting) Group 4	Chapanis (1964)
	Vigilance-Mack- worth Clock Test	College students	30 Males 30 Fe- males	(self recorded KR) Ss given verbal KR showed less decrement and sign higher overall performance than control group or machine presented KR. Absence or presence of ob-	Hardesty, Trumbo, & Bevan (1963)
Knowledge of re- sults- goal set- ting			students	formance if the task pro-	Korman (1970a, 1970b)
Knowledge of re- sults- goal set- ting	Monitoring	College students	45 Males	KR alone did not facilitate performance. Reward plus KR did facilitate performance. Training under KR plus reward did not enhance criterion performance. All groups showed performance decrement.	Weber (1965) .
Knowledge of re- sults- goal set- ting	Addition of num- bers	From campus em- ployment service age 18 - 37	47 Males 73 Fe- males	Variability in performance was a function of ability rather than goal setting or knowledge of results.	Sauer (1970)

	Type of Task				279
Major Topic	or Study	Sample	N	Major Results	Reference
Knowledge of re- sults- goal set- ting	Visual monitoring task	Army trainees	80 Males	Four groups were in dif- ferent conditions (1) R=Monetary reward (2) KR=Informed of signals missed (3) R+KR=Money & informa- tion (4) C=Control All experimental groups	Sipowicz, Ware, & Baker (1962)
				were better than control. Combination of R+KR produced highest level of signal detection. Individual differences are primarily motivational.	ACCOUNT OF
Knowledge of re- sults- goal set- ting	Visual monitoring	College students	168	Defining task as a test rather than an exercise with immediate KR depresse high performance.	Strang (1972)
Knowledge of re- sults- goal set- ting	Vigilance visual monitoring	College students	64. Males 1] Females	KR facilitated performance during training. However the performance standard on which KR was based (high or low standard) had little effect on performance. Fa- cilitation of performance by KR implies same degree of self evaluation.	Grasha, Seibel (1973)
Knowledge of re- sults-goal set- ing	Visual monitoring	College students	37 Males	KR group had sign. higher signal detection rates on all five training sessions but not in a follow up transfer session compared to NOKR group. KR group had more false alarms in first two training sessions	Wiener (1969)
Knowledge of re- sults-goal set- ting	Visual monitoring	College students	84	Time sharing between mon- itoring and tracking de- graded performance on both tasks. KR did not affect time sharing results. Groups which received KR neither improved nor de- clined in monitoring per- formance when the time sharing load was imposed.	Wiener (1975)
Knowledge of re- sults-goal set- ting	Visual monitoring	College students	24 Mhles 64 Mhles	Specific type of KR given influences results. If KR provides ratio of signals to non signals Sa use it to manipulate response criterion. If KR involves specific information Sa use it to increase their sensitivity to a signal. KR can have detrimental effects.	Williges & North (1972)
Motivation- rewards	Constructing and validating a test	College students	,102	For low ability Ss performance was positively re- lated to control. Success produced increased satisfaction and perceived ability while failure led to decreased porceived ability. Ability measure was whether subject was trained or not trained in test construction.	
Motivation- rewards	Jigsaw puzzles	College students	40 Meles	Interaction found between intrinsic and extrinsic motivation for task satisfaction variable and trend for interaction on task parsistence.	Calder & Straw (1975b)
Motivation- rewards	Repetitive task (scoring tests)	College students	135 Mele & Female	persistence.  Rewarded subjects reported greater satisfaction with fellow workers, supervisor and tasks compared to non rewarded or unknown reward group.	Cherrington (1973

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Motivation- rewards	Letter cancella- tion tagk	College students	30 Male 46 Female	As difficulty of task increased success was seen as more attractive and failure as less repulsive particularly when ability is involved rather than luck. N - ach and anxiety and external control not related.	Feather (1967)
Motivation- rewards	Repetitive task (scoring tests)	College students	90 Male & Female	Significant positive r satisfaction and productiv- ity of rewarded high per- formers and non rewarded low performers. Sign. neg- ative r - rewarded low performers and non rewarded high performers. No sig- nificant r satisfaction and productivity total sample.	
Motivation- rewards	Puzzle Writing headlines Puzzle	College students College students	24 Exp. 2 6	Contingent monetary reward,	(See also Calder & Straw 1975a, 1975b; Deci, Cascio, & Krusell, 1975)
Motivation- rewards	Search task and rounding numbers	Pemales	169	Performance and satisfac- tion higher in achieve- ment feedback contingent group compared to non con- tingent money outcome or control group. Instrumen- tality theory predictions are confirmed with bound- aries.	Motz (1975) Grzen (1969)
Motivation- rewards	Scoring of math or sex survey	College students		Contingent monetary re- ward that is not delayed has an additive effect on intrinsic motivation.	Hamner & Foster (1975)
Motivation- Rewards	Nonsense sylla- bles and geomet- ric forms	College students	230 Male & Female	In high success reinforce- ment condition probability of change in task prefer- .ence was greatest.	
Motivation- Reward	Road race	College students	78 Male	Performance was controlled to give subjects experience of reaching criterion after producing many errors (poor performance) or few errors (good performance). Results indicated that subjects are less intrin- sically motivated not be- cause of pay but when the	
7	10 A30 A30 A30 A30 A30 A30 A30 A30 A30 A3	with North  Deploy  Deploy	e toc vice	task is perceived as easy relative to their ability. Good performers liked and enjoyed task more when not paid. Poor performers liked task when paid. However good performers were more satisfied with their performance when paid and vice versa for poor por-	
Motivation- Orientation	Repetitive tasks (anagrams, digit symbol dynamo- meter)	Boldiers	. 54	Ss who endured noxious stimulation longer per- formed better on all tasks Motivation accounted for less variance in criterion	Fine (1972)
Motivation- Orientation	Computer coding	College students	37 Urban 37 Rural Pemales	than did intelligence. No difference in performance, urban-rural groups. Subjects with rural socialization-trend more satisfied with pay and task.	Fossum (1974)

Major Topic	Type of Task or Study	Sample	N	Major Results	Reference
Motivation- Orientation	Anagrams	Navy enlisted men	214 Male		Kipnis & Wagner (1965a)
Motivation- Orientation	Anagrams-Pursuit motor	Navy enlisted men	70 - 140		
Motivation- Orientation	Repetitive Task Drawing X'e	High Protestant Ethnic Low Protestant Ethnic	20 Males Female 20 Males Female	group spent more time work-	Merrens & Garrett (1975)
Motivation- Orientation	Job redesign case studies		103 Male		Richman (1972)
Motivation- Orientation	Computer coding	College students	60 total 14 ex- trinsics 46 in- trinsics	Extrinsic Ss more satis- faction, specialized task.	Robey (1974)
Motivation- Orientation	Anagrams	Intrinsic orientation (IO) Extrinsic orientation (EO)	96 Males	TO's perceived task as more difficult and felt	Saleh (1971a)
Motivation- Orientation	Anagrams	Intrinsic Orients tion IO's Extrinsic Orients tion EO's		Low anxious EO's performed better than high anxious EO's in all conditions. Low anxious IO's performed better than high anxious IO's only in the alone simple task condition. No significant difference found in task satisfaction. Concluded that EO's are more affected by anxiety.	
Ability	Problem solving (concept identi- fication)	College students	59 Males 69 Fe- males	Six ability factors identi- fied: flexibility of closure, associative memory perceptual speed, syllo- gistic reasoning, sheed of closure, induction. As task changes in complexity a- bilities change in impor- tence.	Rose, Wheaton, &
Ability	Verbal learning	College students	100	Following ability factors relate to verbal learning: rote memory, span memory, letter pairs and anticipation. Rote memory major individual difference variable.	Fleishman (1967)
Ability	Review of research motor learning			Identified 11 Psychomotor factors and 9 physical proficiency factors. Changes in abilition necessary to perform task change as task is varied and as individual learns and becomes proficient in the task.	Fleishman (1967c
Ability  Ability  Ability  Ability  Ability	Bi-manual matchine device	College students	57 Males	Ability measures, predicted performance during original and reversed tasks but personality did not. Rate of learning not predicted from ability or personality. Performance during massed practice as predictable as during distributed practice	
Ability	Psychomotor (pursuit rotor)	College students	50 Males & Pemales	In Group I accuracy was emphasized; Group II speed emphasized. During training differences in approaching task account for task apecific factor variance.	Hinrichs (1970a)

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282	TVES OF TASK	Table 4	(Cone a.)	*	
Haior Topic Ability	or Study	Sample College students		rior in performance on com- plex task with less decre- ment. No difference in performance field independ- ent and dependent on simple task.	Reference Moses (1976)
Ability	Electronic Fault finding	College students	141 Male	Five factors identified: flexibility of closure, syllogistic reasoning, as- sociative memory, percep- tual speed and induction. Manipulation of formal dif- ficulty and perceptual com- plexity resulted in change of factor loadings for all factors except syllogistic reasoning which remained constant and perceptual speed which was not re- lated to performance.	Pose, Fingerman, Wheaton, Eisner, & Kramer (1974)
Ability	Review of research (1) auditory signal detection task (2) trouble shooting (3) problem solving	A STATE OF THE STA		Complex changes in ability requirements occur in response to variations in task characteristics. Individuals adopt different strategies under different levels of task difficulty.	Wheaton, Rose, & Fingerman (1975)
Ability	Auditory signal detection task	College students	127 Male	Five ability factors identified auditory perceptual, flexibility of closure, associative memory, speed of closure, induction. Task difficulty did not influence ability factor structure. Investigated different signal durations and background noise.	Mirabella, & Fleishman (1973)
Ability	Visualization of manuevers test	Air Porce	218 - 8158	Ability factor structure changes as item complexity increased. Three factors: perceptual speed, space an visualization were ordered on a continuum from least difficult and complex to most difficult.	Zimmerman (1954)
Personality	Auditory vigi- lance	Extraverted Introverted Normal	62 Male 62 & Fe- 21 male	Extraverts and normals show decrement over time. Introverts do not. Trend extraverts benefit from social condition.	Bakan, Belton, & Toth (1963)
Personality	Repetitive task	Extraverts Introverts	N=16 Males N=16 Males	Extraverts build more va- riety into their responses on monotonous task over time.	Hill (1975)
Personality		College students	males	Groups containing field de- pendent-low differentiation subjects reconciled disa- greements and showed greate interpersonal attraction than did field independents Match between subjects did not always result in posi- tive outcome.	Goodenough, Witkin, FFreedman, & Friesman (1975)
Personality	Kinesthetic Pigural After Effect, Prefer- ence for Complex Stimuli, Activity Level, Group Dis-		24-44 Males & Pemales	Reducers on Kinesthetic After Effects Tasks seek out complex stimulation, she high levels of activity in deprived stimulus situation talk more in group discus- sions, and expose, them- selves frequently to intense stimulation in social activities.	
Personality	Monitoring audi- tory or visual stimuli Placing figures of people in model rooms	Study 1 College students  Study 2 College atudents	39 Males 12 Fe- males 17 Males 13 Fe- males	Reducers expressed heredom and less task enjoyment on simple and moderately com- plex task than augmenters. Reducers are coffee drink- ers and were raised in urban setting. Reducers appeared early for ex- periment and showed de- sire for social stimula- tion.	Sales, Guydosh, a Tacono (1974)

the study from a college campus. Participants in the study worked for four days building electrical extension cords in groups of five. Each group had a supervisor assigned to them. All subjects were paid an hourly rate and were allowed to set their own work pace.

The factors of content and discretion were experimentally varied. The low content condition consisted of having subjects work on an assembly line while the high content condition allowed them to individually build the extension cords. The discretion dimension was varied by giving very specific instructions in the low discretion condition and more flexible instructions in the high discretion situation.

In this first experiment, the design was similar to field situations in which employees worked on traditional jobs which were subsequently enriched. All the participants worked on a low content and low discretion job for two days. On the third day, one group continued to work on a low content, low discretion job while the three other groups had either content, discretion, or a combination of both dimensions added to their jobs.

Maher (1971) reported that, as predicted, the high content and high discretion group had the highest performance, while the lowest performance occurred in the group with low content and low discretion. It should be noted that no test of significance for the results was reported, nor was the number of subjects in each group specified. It was reported that there were no differences in job satisfaction across the four groups. There was one trend in the data that the most enriched and least enriched groups rated

their jobs in almost the same manner, and this rating was unfavorable. The two middle groups, in terms of job enrichment, were somewhat more satisfied. This result will be discussed in more detail later.

The second experiment was designed to control for the Hawthorne effect. This was accomplished by assigning subjects to one of four groups for the entire four-day work period. The results were similar to the first experiment with one marked exception. That is, the job with low content and high discretion had by far the highest productivity. Again, the statistical significance of differences between groups on the measure of performance was not included. The satisfaction data again paralleled the results from the first study with the two extreme groups having the lowest satisfaction.

In the last experiment of the series, all the participants worked on the enriched job for two days; then on the third day, one group had both the content and discretion removed from their jobs (job shrinkage), while the other group retained their high content and high discretion jobs.

The group who lost both content and discretion performed significantly worse on the last day of the experiment compared to those who kept the enriched job. Maher gives two explanations for the job satisfaction data not yielding the expected results. He postulated that there were perhaps two groups of subjects: those who were concerned with minimizing the amount of work they did and those who sought the task variety contained in the enriched

jobs. Maher states that if these subjects were equally represented across groups, no differences in satisfaction should be found. It was assumed that people who preferred the variety in an enriched job would have increased satisfaction, while those interested in minimizing effort would receive less satisfaction and would thereby cancel out the expected differences. Even if this explanation is accepted as accurate, it still does not cover the curvilinearity obtained in the satisfaction data.

The second explanation advanced by Maher is based on an equity approach. He claims that the theoretical model of equity in which there is underpayment of subjects in an enriched job predicts exactly the satisfaction results obtained. It should be noted that Experiment 2 was the only situation where significant differences in satisfaction were reported. In that study, all four groups worked at the same job, and they were not aware of the job conditions of the other groups. Therefore, there was no opportunity for groups to compare their job type with other groups. Added to this is the fact that there was no pressure for production, so it is difficult to underscand why differences in equity would account for the experimental results. Moreover, in Experiment 3, one group of subjects' jobs were changed to have low content and low discretion and thereby, following the reasoning of equity theory, the jobs should now consist of less demanding work and be overpaid, but there was no significant difference in satisfaction for that group as compared with the group having high content and discretion. The second state of the delicity selection

In Experiment 1, all subjects started in the job with low content and discretion, but there was no significant difference in the satisfaction obtained across the four groups.

Inadequate and incomplete data was presented to allow for an independent judgment of the critical variables of performance or satisfaction. Although some data were presented on preference for variety and desire to minimize effort, the N sizes were extremely small in all the studies, and it is very hard to make a convincing argument that is supportive of any proposition.

The arguments presented in support of equity theory are not convincing because, from the details in the experiment, there was no indication that the subjects in one group compared their work with subjects in other groups. Equity theory proposes that if you have two different people doing the same job for the same salary, and you then ask one person to take on additional, more challenging duties and responsibilities, while the second person continues to do the less challenging job for the same pay then the first person, whose job has become more enriched, will become dissatisfied. This proposition does not seem to apply to Maher's research, as there did not appear to be direct comparisons by individuals in the various groups in terms of their jobs. Maher did indicate that there appeared to be individual differences in terms of preference for the enlarged job. He reports that they could not identify these people in advance from the measures they obtained.

Another problem with the interpretation of the results in the framework of Adams equity theory is that if we accept the proposition that those in the enriched jobs see an inequity, then one way to decrease that inequity is to reduce productivity. This did not occur in the studies reported.

### Manipulation of Responsibility and Task Load

Lanzetta and Roby (1956), in a simulation of an air defense center, considered two levels of job structure. One structure involved sharing the essential activities, while the second structure gave the responsibility for the activities to one individual. The second structure might be considered an enriched position with increased responsibility. The task load was also manipulated in the 2 x 2 design having both a high and low work load condition. In general, the high task load condition resulted in somewhat poorer work performance, as was anticipated. Their findings were generally nonsignificant, but there was some indication that for those individuals having more responsibility, there was superior performance under the low task load condition; while in the job where the activities were broken up, there was somewhat superior performance under high task load conditions.

In summary, the study did not show any real superiority of giving individuals added responsibility for more activities in this type of decision-making task. The results merely point out the fallacy of making the assumption that increasing responsibility and the number of activities to be performed by an individual will automatically result in higher task performance. While the study did not include measures of individual satisfaction, it was found that under the high task load condition there was an improvement as a function of practice which was not true under a low task load condition.

## Job Design, Ability, and Rewards

Relatively few studies investigate ability as it interacts with the design of a task or job. Weinstein and Holzbach (1973) report a laboratory study which involved individual ability, task structure, and distribution of reward while performing a simulated job. The task of the subjects was to code responses from a questionnaire onto an Opscan computer form. The task was either one which required low or high task flow interdependence. In the high task flow interdependence condition, each person in a three-man group worked on one problem from each questionnaire requiring the passing of the questionnaire from one person to the other.

A differential or equal reward condition was also established. In the differential reward condition, they were told that the person who coded the largest number would receive one-half of the group's earnings. In the equal reward condition, they were told that they would receive one-third of the group's earnings. Subjects were randomly assigned to one of the four experimental conditions.

At the end of the task, all 72 male undergraduate students were given a questionnaire which tapped both the subject's perception of the manipulation and his satisfaction with his performance. Prior to the beginning of the study, each subject completed the Minnesota Clerical Test.

The subjects were more productive in both the low task flow interdependence condition than in the high task flow condition and were also more productive when performing in a differential reward

than in the equal reward condition. Satisfaction was less, though, when performing in the differential reward condition.

Even though differential rewards resulted in greater productivity, no relationship was found between productivity and satisfaction. There was definite support for differential validity of the ability measure as a function of the experimental condition. Performance of subjects in the equal reward low task flow interdependence condition were more predictable on the basis of clerical test scores. A utility of selection analysis indicated that the differential reward, low task flow interdependence groups, with testing yielded the greatest gain of productivity with a low selection ratio (up to .22). For higher selection ratios, above .22, productivity was higher in equal reward, low task flow interdependence groups. From the results, it is evident that if selection were to be undertaken with this ability measure, one would also have to take into account the rewards and the structure of the task.

### Redesign of Inspection Tasks

Laboratory studies and simulations have shown that even minor physical job design changes can influence performance.

Lion, Richardson, Weightman, & Browne (1975) have reviewed a number of factors which may influence performance. These factors include the visual display, speed of the conveyor belt, pauses for rest, and working alone or working with someone else. In a laboratory simulation of conditions found in industrial inspection, three conveyors were especially designed and built for the study. A single belt, three-line and six-line conveyor belt system was used.

Each belt on the three-line system ran at one-third the speed of the single-line machine so that identical material was presented per unit of time. The six-line conveyor belt moved at one-third the speed of the single-line machine, therefore, presenting twice as much information per unit time if one subject was using it. Two subjects worked together on a six-line belt while subjects worked alone on the single and three-line belts. On each trial, the subject inspected 1,000 discs, of which 100 were faulty.

The performance of the subjects, based upon the type of conveyor system, was highly significant with more faulty discs being missed on the single-line and the least on the six-line belt.

It is evident from this research that both the form of the display, i.e., one belt or three belts, and the presence of a coworker, can have a significant effect upon the quality of performance of workers.

Only recently have researchers, such as Drury (1975), begun to derive models to predict inspector performance. These models help us to understand what effects changes in parameters, such as the size of the defect, will have upon the speed and accuracy of inspector performance.

Relatively simple changes in the organization of work can, at times, have a dramatic effect upon quality performance. Drury and Addison (1973) reported that simply moving special inspectors closer to the point of regular inspectors, which allowed for more immediate feedback, resulted in such dramatic change in performance of the regular inspectors that the probability of missing a fault was halved after the change.

Simon (1965) has found in a laboratory experiment that detection of radar targets was frequently faster on a moving display compared to a static mode. This finding tends to contradict other research in the area which indicated that a static mode resulted in greater accuracy of target detection.

Schoonard and Gould (1973) studied the simulated inspection of integrated circuit chips. Six women in the first study searched each circuit chip until they found the defect. They located its position on a scoring sheet. No knowledge of results was given to the women. The task was self-paced with each subject initiating a new circuit chip.

The results indicated that knowing or not knowing a defect was present did not significantly increase response accuracy. In addition, the increased time to search each chip still resulted in approximately 25% of the defects not being detected, which is consistent with other research. The first experiment also indicated that there was not much improvement in inspection accuracy after the first 60 seconds of inspection time.

The second experiment was designed to restrict the field of view to see if this factor would improve inspection accuracy.

Restricting the field of view did not result in any appreciable gain in inspection time accuracy, and inspectors became bored after looking at a restricted view for more than 30 seconds.

Schoonard, Gould, and Miller (1973) have also studied other aspects of visual inspection. They found large individual differences among inspectors in accuracy, with the most accurate inspectors also being the fastest.

The effect of speed on accuracy of inspection was also investigated. There was a 25% increase in the quality of inspection with increases in inspection time ranging from 50% to 200%. However at the slower speeds, experienced inspectors tended to find the task tedious and boring. There appears to be a trade-off between increased inspection accuracy with more time and the subjective feelings of tedium when the pace of a visual inspection task is too slow.

Some of the complexities of method of presentation of material in visual inspection were studied by Fox and Haslegrave (1969) in a field setting. They found that raising the probability of detection increased the level of defects found for the unpaced inspection of screws but not for the inspection of screws on a paced or conveyor belt condition.

#### Job Design and Work Values

Robey (1974) designed a laboratory study to test the contingency prediction of Hulin and Blood (1968) that job satisfaction and performance are moderated by task design and work values. Hulin and Blood extrapolated from community characteristics to make the prediction that those individuals alienated from middle-class norms would receive higher satisfaction from a more specialized job and lower satisfaction from an enlarged job. For those individuals with values congruent to middle-class norms, the opposite prediction would be made. Hulin and Blood used community characteristics to measure alienation. Robey's approach was to measure work values more directly and is a method which Hulin (1973) has

recently advocated as the preferable technique. Robey selected Friedlander's (1963, 1965a) questionnaire to measure intrinsic and extrinsic work values. Robey assumed that extrinsic work values would correspond to the alienated blue-collar dimension identified by Hulin and Blood. A basic premise of the study is that we accept Friedlander's instrument as a measure of alienation from middle-class norms. This is certainly a defensible approach since Hulin and Blood did not specify in their discussion an approach or instrument to be used to directly measure individual alienation from middle-class norms.

One hundred and twenty-six college students responded to 14 items of the questionnaire. The questionnaire was then factor analyzed with the first factor labeled "concern for extrinsic job aspects" and the second factor, "concern for intrinsic job challenge." The extrinsic factor was defined by such items as "management policies which affect the feelings of employees" and "a smooth and efficient work group." The intrinsic factor had high loadings on questions such as "performing challenging assignments on my job" and "a feeling of achievement in the work I am doing."

Sixty volunteers were then classified as either having intrinsic or extrinsic value orientation and were assigned to a treatment group which was considered to be an enriched job and one
which was considered to be more routine. There was considerable
imbalance in the design since only 14 of the volunteers were
classified as having extrinsic values and 46 were classified
as having intrinsic values.

The basic task consisted of assigning work orders to machines in a simulated organization under either a computer or hand treatment. The simple computer treatment merely involved transcribing data onto forms while the hand treatment was more complex and was considered the enriched task. Each subject worked for three one-hour sessions.

Measures of work satisfaction and errors in the work completed by the subjects were obtained. A direct comparison of performance was not possible as the tasks differed.

The measure of satisfaction did show a weak relationship in the expected direction with the individuals classified as having extrinsic values being more satisfied with the simplified task, while those subjects with intrinsic values received more satisfaction from the enlarged job.

The results from the performance measures were somewhat more complex and did not fully support the prediction as there were no significant differences in performance between the intrinsic and extrinsic groups performing the simplified task. The results of the enlarged task were in the expected direction, with the group having intrinsic values showing significantly higher performance levels than the extrinsic group.

As with any simulation, there were some problems involving the possible range of error which could occur on the simplified task. Future research on this issue must fully consider the nature of the task and use tasks in which there is greater individual variation in performance. A larger sample would also allow for

more individuals in each of the cells. The small number of subjects and possible ability differences between the subjects assigned to the treatments may have canceled out any performance effects due to the various systems in Robey's study.

# A Congruence Approach to Job Design

Lacking from research on job design is the simultaneous investigation of individual perceptions, ability levels, and other attributes as they interact with the job design. An attempt was made to integrate the various elements of these approaches to job design (Barrett, Forbes, Alexander, O'Connor, & Balascoe, 1975).

Simulated visual monitoring tasks were developed based on information from a previous field study (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975). These simulations consisted of a basic signal detection task in which a subject had to identify relevant symbols from slides containing both irrelevant and relevant symbols. The experimental design consisted of two levels of task design. In the "basic" cell, subjects were given a task designed to consist of low levels of job complexity, variety, responsibility and external feedback (Low Job Structural Attributes - LJSA). In the "complex" cell, subjects were presented with a task of increased job complexity, variety, responsibility and external feedback (High Job Structural Attributes - HJSA).

The low level of job complexity and variety consisted of a task in which subjects were required to detect the presence and the movement of only one type of signal (a triangle). In the high level of complexity and variety, there were three different

the strong empirical evidence thank the

types of relevant signals (triangles, circles and cloverleaves).

Furthermore, the subjects were required to respond to different

types of movement for each type of signal.

The low level of responsibility was manipulated by instructing each subject that three other subjects were monitoring the same area and that it was only necessary for one subject to detect a signal for the system to operate properly. High responsibility was induced by instructions indicating that each subject was individually responsible for signal detection and operation of the system.

External feedback was manipulated by informing subjects in the LJSA condition that only group measures would be recorded precluding individual feedback. Subjects in the HJSA conditions were told that individual feedback would be given at the end of each session.

The subjects consisted of 60 undergraduate college students (both males and females) who worked on the simulated monitoring task for three consecutive one hour vigils. Subjects completed a test battery designed to measure general and specific abilities as well as personality variables, work satisfaction, motivation and preferences for job attributes. After completion of the experimental monitoring task, the subjects completed post measures of job perception and job satisfaction.

The results indicated, as predicted, that response time was longer, and there were significantly more errors in the HJSA condition than the LJSA condition. This study added support to the strong empirical evidence that has accumulated indicating

that perceptual style relates to performance on a variety of simulated and real world tasks in which monitoring is an essential component.

The results of this study demonstrated a strong positive relationship between perceptual style and job performance and a negative relationship between perceptual style and work satisfaction. This indicates that those individuals with the most specific ability for performing the monitoring task derived the least satisfaction from it. These results are compatible with the field study of Naval monitoring personnel which found a high negative correlation between general and specific ability measures and work satisfaction (Barrett, Bass, O'Connor, Alexander, Forbes, & Cascio, 1975).

Task characteristics moderated the relationship between ability and personality variables, work orientation, job attribute preferences and descriptions, satisfaction and performance. In the HJSA conditions there was a consistent relationship between the description of the job attributes and satisfaction received in performing the tasks. This was not true in the low condition.

The possibility that task complexity is a crucial variable in the relationship between individual attributes, task performance and satisfaction was indicated by the finding that when ability was partialled out, certain motivational factors were related to job performance in the LJSA condition only.

In conclusion, the laboratory studies of simulated monitoring tasks have demonstrated the strong effect of individual

attributes upon performance and satisfaction and the complex interactions between these individual and job structural attributes.

Another related study involved a simulated maintenance task in which experimental subjects had to locate malfunctioning components in the form of incorrectly punched computer cards in a series of computer card decks. The experimental design consisted of two levels of psychologically manipulated job structural attributes. In the low job structural attribute condition (LJSA) subjects were instructed that the task consisted of a low level of responsibility, feedback and opportunity to learn new skills. In the high job structural attribute condition (HJSA) subjects were told that the task was high on these attributes. Responsibility was manipulated by informing the subjects in the HJSA condition that they were individually responsible for the repair of malfunctions. In the LJSA condition subjects were told they would be able to correct malfunctions in only a portion of the total equipment deck, therefore, making them only partially accountable. Students in the HJSA condition were told that they would be given feedback on the quality and quantity of their performance while subjects in the LJSA condition were told that feedback could not be given. Subjects in the HJSA condition were told that the maintenance task provided a unique opportunity to learn a valuable systematic approach to problem solving. Subjects in the LJSA condition were informed that the task was routine and repetitive in nature. It should be emphasized that responsibility, feedback and learning new skills were manipulated psychologically

only, as all subjects completed the <u>same</u> physical tasks during the experimental session.

The subjects consisted of 60 undergraduate students (both males and females) divided equally into either the HJSA condition or LJSA conditions. Subjects completed a test battery designed to measure general and specific abilities, personality variables, work orientation, motivation and preferences for job attributes. After completion of the experimental task, subjects completed measures of job perception and job satisfaction.

After training to insure that subjects had achieved a minimum understanding of the task instructions, the subjects worked at their own rate of speed for three consecutive hours on the simulated maintenance task.

The results indicated that the structural attributes of responsibility, feedback and learning were successfully manipulated in the HJSA and LJSA condition, as significant differences were indicated on two post measures of job perception.

Intellectual ability was found to be strongly, but differentially, related to performance across experimental conditions on this simulated maintenance task. Intelligence was positively related to quantity of performance in the LJSA condition and to quality of performance in the HJSA condition. It is possible that these results may be a function of the differential value placed on the quality or quantity aspects of performance by the subjects. Subjects in the LJSA with higher ability may have concentrated their effort on speed while subjects in the HJSA condition, who were faced with the prospect of feedback, concentrated on quality rather than speed.

Cognitive style was also differentially related to performance across conditions. Field independent subjects performed better in terms of quantity of production in the LJSA condition while this pattern was reversed in the high condition. It is hypothesized that this reversal may be a function of differences in suggestibility and conformity between field independent and dependent subjects. Field independent subjects may not have been convinced by the psychological manipulation embedded within the experimental instructions.

Described job structural attributes were found to be related to performance and satisfaction outcomes. The greater the amount of attributes assigned to the task the higher the satisfaction. Moreover, the smaller the difference between the described and preferred dimensions of job attributes, the higher the satisfaction. It was also found that dividing the subjects on the basis of described job structural attributes moderated the relationships between ability and performance. Carlson's finding that the ability-performance relationship was stronger for satisfied individuals was replicated in the study (Carlson, Dawis, & Weiss, 1969).

This study demonstrates the strong effect expectancy can have upon the relationships between ability measures and job performance. The findings reinforce the results from a recent field study (King, 1974) that the beliefs of the incumbents concerning the attributes of a job they are performing may be more important than the physical task itself.

### Job Factors

### Work Pace

Williges and Streeter (1971) simulated a quality control inspection task in order to determine if an inspector-paced or more conventional assembly-line externally paced display would allow for detection of more defects. The externally-paced inspection resulted in an increased error rate but did result in more items being inspected. The superiority of the inspector-paced display, in terms of quality of performance but not quantity, is similar to results found in field studies of the inspection process.

While the Williges and Streeter study did not deal with the issue of satisfaction, a more recent study by McFarling and Heimstra (1975) involved both self- and machine-paced inspection and the satisfaction received from the task. Twenty women were utilized in this simulated study of the inspection of printed circuits which varied in complexity. The circuits were presented from slides; and in the paced condition, each circuit was displayed for a total of 8 seconds. In the self-paced condition, the viewing time for circuits was controlled by the inspector. The 10 subjects in the self-paced condition rated the task as more controllable, interesting, and important than did the machine-paced subjects. Conversely, the 10 subjects in the machine-paced condition rated the tasks as slightly more demanding and repetitive. However, both groups perceived the tasks to be relatively unpleasant.

As would be expected, the decision time increased under both conditions for the more complex circuits. There were larger in-

creases in decision time for those subjects in the self-paced condition as complexity increased. There was significantly more defect detection in the self-paced condition. The actual quantity of performance was less in the self-paced condition as 2 of the 10 subjects did not complete all the inspections in the alloted time period.

McFarling and Heimstra (1975) and Williges and Streeter (1971) reached the same conclusion that self-pacing leads to better quality inspection performance. This is not really a surprising finding, since in a self-paced condition, an individual has more time to inspect an item; and as a result of the increased uncertainties, there is every reason to believe that there would be improved performance. However, the generalization of this finding over an extended period of time in the laboratory has not been tested. It is possible that over an extended period of time, the machine-paced procedure may result in equivalent error rates. In addition, the inspection times in the machine-paced condition have been somewhat arbitrarily established. It may be possible to slightly increase the machine-pace time per item so that you would maximize, not only quality, but also quantity of performance. In effect, the studies have been comparing self-paced versus one of the many possible machine-paced conditions. In order to fully accept the proposition that self-pacing is superior, one would have to study a wide range of machine-paced conditions.

### Preferred Pace

A neglected area of investigation until relatively recently is the preferred pace of individuals performing repetitive motor

tasks. Smoll (1973, 1975a, 1975b), in a series of laboratory studies, has found that there are reliable differences between individuals in their preferred pace of performing repetitive motor tasks and also reliable differences in the consistency of this preferred pace. Some individuals are more inconsistent in their performance at a motor task than others, while others are relatively consistent and often have a high rate of performance. There is some other evidence that the preferred tempo of work is true, not only for motor, but also perceptual and cognitive tasks (Rimoldi, 1951).

This appears to be a relatively important finding which indicates that job design should take into account individual preferences. It is quite conceivable that an individual's dissatisfaction with a repetitive-paced task may be due to the fact that the pace is in variance with his natural preferred tempo of work. This dissatisfaction with the task may not really be caused by a lack of control over the task but merely the fact that the worker's preferred motor tempo is quite different from the pace requirements of the actual task. Moreover, the fact that some individuals are more inconsistent in their preferences than others could lead one to hypothesize that satisfaction is a function of the match between an individual's preferred pace and consistency and task demands. Those individuals performing a paced task in which the pace is consistent with their preferences would experience enhanced job and task satisfaction compared to those individuals where there is

no congruence between the task pace and their preferences. One could further hypothesize that those people who are quite inconsistent in their preference for the tempo of motor activity would find any paced task relatively unsatisfactory. It is quite conceivable that this group of workers would subjectively voice and experience the most dissatisfaction over the lack of control they had while performing a paced task in an industrial setting.

Boredom

Murrell (1967, 1969, 1971), in a series of studies, had conducted experiments in the laboratory to understand the behavior of subjects performing monotonous tasks.

Murrell's position is based upon the concept of auto-arousal, which is a mechanism which comes into play when the individual "makes up his mind" to perform well on a task. Murrell defines auto-arousal as "cortical activation resulting from stimulation of the reticular formation by the cortex, this stimulation being under voluntary control" (Murrell, 1967, p. 430).

Murrell's (1969) results are not clear-cut and do not fully support his theoretical position. The variation between and among subjects are not fully explained, and he has introduced an additional explanatory construct of anti-arousal. Perhaps the most general finding is that performance can be influenced by the expectations developed during the course of the experiment (Murrell, 1971).

The measure of arousal used by Murrell has been skin conductance, and the results are not clear-cut enough to provide

easy generalizations concerning the phenomena of arousal. The sample sizes are relatively small, and it is evident that more work is required to fully support or modify Murrell's position concerning the usefulness of the construct of auto-arousal.

Geiwitz (1966), perhaps in one of the most unusual experimental laboratory studies related to job design, used a simple repetitive task and hypnosis to study the experience of boredom. The results are quite interesting if you can place reliance upon data from four subjects. In general, the factors of low arousal, feelings of unpleasantness, constraint, and repetitiveness are associated with perceived boredom. Perhaps the most interesting finding was that, while the subjects expected repetitiveness to be the first factor in inducing feelings of boredom, in fact, it appeared to be the least important factor. Constraint was the variable which was found to be more important than repetitiveness.

These results are not consistent with some field investigations such as those of Quinn (1975) where repetitiveness was found to be closely associated with both boredom and monotony.

Stagner (1975) has reviewed the evidence concerning job satisfaction of the older worker while performing assembly-line operations. His review includes both psychological and physiological correlates of boredom and the possible implications for the aging process and the suitability of individuals for paced tasks. The evidence indicates that blue-collar workers' satisfaction for a job increases with age. This conclusion has to be tempered with the fact that there are very few older workers actually working on assembly lines.

Stagner, in his review, concludes that there are wide individual differences in workers' response to the paced, constrained job. In particular, the aspect of constraint appears to be an extremely important factor in leading to boredom. Stagner believes that it may be possible to match blue-collar workers in some manner in order to maximize work satisfaction. Stagner concludes that much more work must be done before this hope will be a reality.

In the area of personality variables, extraversion, authoritarianism, and ambition have all been related to boredom. The research is neither recent nor thorough, since Stagner believes that the Wyatt, Langdon, and Stock study of 1937 is still the best study which focused upon personality problems.

Recent research has indicated that extraverts build more variety into their responses in a monotonous task (Hill, 1975).

Sales, Guydosh, and Iacono (1974) found that college students with high auditory thresholds, who may reduce incoming stimuli, were unresponsive to simple stimuli, were bored, and expressed less enjoyment and interest than low threshold subjects. High threshold subjects were more likely to drink coffee, come from urban settings, and show a greater desire for social stimulation.

Organizational Structure and Work Groups

The distinction between research in organizational structure and job design is not clear-cut. This is especially true when one reviews laboratory studies concerned with organizational structure. The common way organizational structure is

operationalized in laboratory studies is by the type of communication network and is exemplified in studies by Bavelas (1948) and Leavitt (1951).

No attempt will be made here to review the many studies in this area. A few selected studies will be reviewed which appear to have relevance for the area of job design.

In many field studies of job design, there is a distinct and explicit attempt to modify the existing communication structure and division of labor. This typically involves job changes to decrease authoritarian structure, to provide greater communication among the workers of the group, and to allow for more shared responsibility for performing the group's task.

Becker and Baloff (1969) have studied these factors in a simulated business game. They formed three different organizational structures: (1) a hierarchical structure, (2) a committee organization, and (3) a division-of-labor structure. All three-man teams performed the same complex problem-solving task. In the hierarchical structure, one man was assigned the position of president and two as vice-president. In the committee organization, they were told they constituted an executive decision-making group and shared the responsibilities for their decisions; and in the division-of-labor structure, each of the three were told that they were like division vice-presidents, each in charge of a specific function.

The division-of-labor structure was found to result in superior performance as compared to the two other structures.

One unexpected finding was that initial group performance level interacted with task structure. For the groups which started out with relatively high levels of proficiency, the organizational structure had very little effect upon the subsequent total overall efficiency of the group. Conversely, if the group's ability to solve the complex problem was relatively low, then the organizational structure had a great effect upon the final outcome of the group's performance.

The results of the study indicate that complete shared responsibility, as in the committee type organizational structure, may not be the optimal task design for certain complex problemsolving situations. One can also infer that if the problemsolving ability of the group is initially very high, the task design will have much less relevance on the performance of the group.

Some of the difficulties and unexpected results are illustrated by Shiflett's (1972) findings from four different organizational structures of two-man groups working on difficult and easy crossword puzzles. The production per unit time was greater in the divided labor condition than in the shared labor groups. The task itself was highly artificial and, therefore, the generalizability to real world tasks is limited.

Shaw (1960), in a laboratory investigation, looked at size and share in tasks and identifiability of individual contribution to the group performance to determine product motivation. The female undergraduates worked in the experimental situation either in large groups of six to eight (small share of task) or small

groups of two to five (large share of task). When the subjects perceived that they had a large share of the task to perform, they tended to choose material which would allow them to do a better and higher quality job despite the fact that more work would be required. The identifiability of individual contribution manipulation was not successful so these results are not meaningful. However, the experiment did indicate that when individuals of a group perceive themselves to have a greater share of the group task, this appears to enhance task motivation in each of the group members. This may help to explain the often reported findings that motivation is inversely related to the size of the working group.

More attention needs to be paid to the complexities of team performance. This is especially true of tasks which are externally paced such as radar controllers. Johnston and Briggs (1968) found, for example, that communication actually inhibited team performance in what was termed a noncompensatory, high load task condition. It would appear that some team's functions can hinder team performance while others can improve the functioning of the team. At this point, we do not have a stable set of principles to allow us to design a task so as to optimize performance for teams under various conditions.

The naive assumption is often made in job design that the team members themselves can autonomously coordinate their activities and functions so as to optimize their performance levels. It is doubtful that this assumption is true, and indeed what is con-

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sidered by many as beneficial (i.e., communication) may in fact be detrimental to team performance under certain tasks or task load conditions. Williges, Johnston, and Briggs (1966) found a significant effect of performance decrement due to team communication.

Naylor and Dickinson (1969) have tested a taxonomy of team performance. Briefly, their taxonomy assumes that team performance is a function of task structure, work structure, and communication structure. Task structure is defined as a function of component complexity, component organization, and component redundancy. They found the most powerful variable influencing team performance in their laboratory involving two-man teams in a multiple-cue inference task was task structure. The study is a good illustration of operational definition of the factors relevant to team performance, but the results are constrained by the highly artificial nature of the task. This makes generalization extremely difficult to typical, real-world situations.

## Knowledge of Results

Despite the widespread advocation of the use of knowledge of results as a viable job design technique, the actual evidence for efficacy of the approach is extremely limited. Gibbs and Brown (1955) had subjects working at the repetitive task of copying pages from a variety of sources with and without a counter on the copying machine. An attempt was made to arrange a condition such that performance would be a function solely of the subject's own set pace. Results indicated that when the participants could see the counter, the activity was significantly higher than when it was blocked from their view.

Chapanis (1964), in an attempt to replicate and generalize the results of Gibbs and Brown's study, designed a study where subjects typed digits into a teletype tape. Sixteen subjects were assigned to one of four groups varying in knowledge of results. In the first group, the subjects received no information concerning their output, while in the second and third groups the male undergraduates could see a counter and thereby determine their performance level if they so desired. The fourth group wrote down their output at fifteen minute intervals during the hour session. The experiment lasted for a total of 24 days. The only effect found was increased performance as a function of number of days the task was performed.

The Chapanis study did not support the findings of Gibbs and Brown concerning the value of knowledge of results while performing a repetitive task. There were a number of design differences between the two studies including the nature of the task which may have accounted for the inconsistency in research results. It should be noted that a total of only 28 subjects were used in both investigations, and this is certainly a sad commentary on the field considering the importance of a construct of knowledge of results as a supposed motivational variable in job design. It is doubtful that any sort of generalizations could be built on such a limited number of studies involving so few subjects.

Hardesty, Trumbo, and Bevan (1963) studied the effect of no knowledge of results, observer-presented knowledge of results, and machine-presented knowledge of results for a vigilance task.

The observer-presented knowledge of results was superior to the other two conditions, which suggest the motivational nature of knowledge of results. Unfortunately, the study was confounded because knowledge of results from the observer was oral, while the knowledge of results from the machine was visual.

Knowledge of results does not always improve performance in monitoring systems, as was found by Montague and Weber (1965).

Warm, Riechmann, Grasha, and Seibel (1973) found that knowledge of results was effective in facilitating performance during training, and this persisted throughout the testing session. They did not find evidence that goal setting was the motivational property which appeared to be operating in this study.

Knowledge of results is not always effective in terms of transferring to the training session as Wiener (1968) found in his vigilance study. Wiener (1975) has also studied a visual monitoring task under high and low task load conditions with and without knowledge of results. His hypothesis was that a second task would facilitate performance by increasing arousal level on the monitoring task. The results did not support this proposition, but the inclusion of knowledge of results into the design did stabilize performance even under higher task load conditions.

One problem of research of this type is that the primary and secondary task loads are highly specific to the study in question and, therefore, generalization is extremely difficult involving other tasks with differing task loads.

Despite the widespread popular conception that knowledge of results is a very effective technique for improving performance, the data is mixed and is typically from laboratory studies. One

of the few studies which studied knowledge of results in a factory setting found the technique to be effective (Leamon, 1974). Seven female workers received graphical knowledge of results concerning their performance each hour. The information was presented by a technician, and the experiment was designed to appear to be a naturally occurring part of the job. The investigation extended over an eight-week period, resulting in significantly improved performance. The informational or motivating component of knowledge of results will require further study before any definitive answers can be reached. Knowledge of results has resulted in goal setting types of behavior which will be reviewed in the next section on motivational factors.

## Cognitive and Motivational Factors

## Ability

Both Fleishman (1957b) and Zimmerman (1954) have found that as the difficulty of the task changes, certain abilities become more or less important in predicting individual performance levels. This finding has not always been found to have held true since Wheaton, Shaffer, Mirabella, and Fleishman (1973) found that changing the difficulty level of an auditory task did not show the expected change. The same basic abilities were found to be relevant for predicting performance at all ranges of task difficulty.

In general, one would have to reach the conclusion that a great deal more knowledge is required on a specific task, and the interaction of the task, difficulty of the task, and specific abilities relevant to the task before general principles can be developed. In particular, a job design changing the level of the difficulty of a task may or may not result in a different pattern

of abilities being relevant in predicting performance. At this point, we do have an a priori technique to determine what pattern of abilities will or will not be relevant as the overall difficulty of the task increases.

This technique is demonstrated by the study of Rose, Fingerman, Wheaton, Eisner and Kramer (1974) involving an electronic fault-finding task. The task was designed to be representative of the problems faced by electronic trouble shooters. The trouble-shooting task was varied along the dimensions of formal difficulty and perceptual complexity. Following the technique of Fleishman and his colleagues, a reference test battery was given to predict task performance. Five factors were extracted from the reference test battery, and some factors increased systematically as both dimensions of the task increased. Other factors decreased in importance as a function of increasing perceptual complexity. The actual criterion measure of performance also was a factor in ascertaining whether or not the factor structure would change as a function of the complexity of the task.

The complexity of the problem is further illustrated by Fingerman, Eisner, Rose, Wheaton, and Cohen (1975) in their study of a concept identification task. They also found that as the task characteristics were changed, the ability which contributed to performance also varied. Again, this was not a simple function, and there was the suggestion that different subjects had chosen different styles or approaches to solving the task problems.

This study was notable for its sophistication of analysis of the results and for its large sample size which stands in contrast to other laboratory studies of the various issues of task design.

This study also clearly indicates the large effect ability measures may have upon performance under different task structures. A typical assumption in both laboratory and field studies is that the ability component is random across conditions. This may or may not be true and is of doubtful validity when the sample sizes are extremely small as is encountered in many studies.

## Intrinsic and Extrinsic Rewards

Hamner and Foster (1975) tested Deci's (1975) proposition that contingent monetary rewards reduce intrinsic task motivation. Both expectancy theory and reinforcement theory would predict that extrinsic and extrinsic reinforcement are additive and both would thereby combine to increase task motivation. In order to test these conflicting theoretical positions, a boring and an interesting task were constructed based upon a coding of a questionnaire. In the boring condition, the subjects were given a questionnaire purportedly from the mathematics department concerning attitudes toward a math course; while in the interesting task, a similar questionnaire was used which consisted of an equal number of items dealing with sexual attitudes of females. encoding process of transferring the responses from the questionnaire to a Fortran coding sheet was identical for the two groups. involvement was induced by having the coder make a summary judgment of the individual's attitude after each questionnaire was coded.

The subjects scoring the sexual attitude survey found the task significantly more interesting across the no pay, non-contingent pay, and contingent pay conditions as compared to the boring task conditions. However, in the boring task condition (the mathematical attitude survey), the contingent pay participants expressed significantly more interest in the task than the no pay or noncontingent pay groups.

In terms of overall performance, those subjects performing the interesting task had significantly lower performance than those performing the boring task. In contrast to Deci's preposition derived from cognitive evaluation theory, those subjects in the contingent pay plan, performing the interesting task, had higher output than those receiving either non-contingent pay or no pay for performing an interesting task. This result adds strong support for the additive nature of extrinsic and intrinsic rewards.

In terms of quality of performance, the subjects performing the boring task had significantly higher error rates. However, there was no relationship between the pay plan and the quality of performance.

Consistent with the results of other studies, there was a positive relationship between satisfaction with pay and performance for those in the contingent pay condition, but no relationship was found in the other pay conditions. These results are in agreement with Andrews (1967), who found in laboratory studies that increased external rewards increased the subjective liking for a task. This was true only when the task was considered to be boring since an additional external reward had no effect on the task that was inherently interesting.

These studies point out some important considerations for job design in general. First, it is evident that the external reward received by an individual can have an important bearing on liking for the task and quantity of performance, but not quality. The quality of work appears to be a function of the intrinsic interest of the task with quality being enhanced when an individual performs an inherently interesting job. Second, this research points out the importance of designing a total job situation in which the pay plan is designed to increase the liking for the task and performance level. Third, the studies indicate that one need not be concerned that intrinsic motivation will actually be decreased by external rewards in contingent pay plans. Andrews and Hamner and Foster tend to support the proposition that internal and external rewards are additive.

## Motivational States

Merrens and Garrett (1975) found that a Protestant Ethic Scale developed by Mirels and Garrett (1971) predicted not only persistence, but productivity, at a simple routine task. In their study, extreme groups of individuals on the Protestant Ethic Scale were asked to perform a task involving putting an X into circles on a sheet of paper with the non-preferred hand. The task was presented to be one which involved eye-hand coordination. Those in the high Protestant Ethic group spent significantly longer time performing this task and completed significantly more of the sheets.

Since this task is so far removed from the usual industrial situation, more data will be required before some firm generaliza-

tions can be drawn concerning the value of the Protestant Ethic Scale. Other laboratory studies reporting the task behavior of individuals differing in intrinsic-extrinsic orientation are reported in Table 4.

Some of the laboratory studies have built in certain expectations concerning the task and manipulated this variable by the task instructions. Feather (1967) manipulated a skill and a chance condition by the instructions given to the participants. Feather found that as the difficulty of the task increased, success became more attractive. When the outcome of the task performance was seen as a function of luck, then repulsiveness of failure, as would be expected, was relatively low. None of the measures of achievement, anxiety, or internal and external control were related to the experimental findings.

Bachman (1964) manipulated training, control over the task, and success in a task requiring students to construct an academic attitude test. The strongest finding was that success in the task increased both satisfaction and perceived ability, while failure in performing the task resulted in a decrease in perceived ability.

Davies, Shackleton, and Lang (1972) postulated that subjects would find a problem solving task more interesting if problems of varying complexity were presented in random order. To test this proposition, three groups of ten subjects each were given a self-paced problem solving task which involved four levels of complexity. Three orders of presentation of the task were arranged so that one group had an increasing order of complexity, the

second group, a decreasing order of complexity, and for the third group, the complexity of the problems was presented at random. The subjects were aware of the order of presentation before the study began. The fastest solution time was obtained by the subjects working on the problem in random order. There were no significant differences between the groups in the number of correct solutions. There were no significant differences among the groups on rated boredom. A measure of time estimation did not correlate with any of the subjective ratings of daydreaming, trying hard, concentrating, or boredom. Those subjects who indicated they were the most bored performing the task, tended to daydream the most, and also, they viewed the task as more difficult but tended to concentrate less and not try as hard.

In this study, no feedback was given to the subjects concerning their performance on the task. In addition, data were not presented regarding the relationship of performance to task liking. However the results do indicate that the uncertainty condition provided the highest performance level at no sacrifice to accuracy, and there was a nonsignificant trend for this group to perceive the task to be least boring.

In another study, actual task success and failure were related to task preferences. Osipow and Scheid (1971) were able to shift task preferences by manipulation of success-failure reinforcement schedules. A total of 230 college students were studied using three different success-failure ratios, 85-15%, 70-30%, 50-50%, for unpreferred stimuli. Using an 85-15% reinforcement ratio, they

were able to shift the preference to the non-preferred stimulus 68% of the time. These results may explain why general intellectual ability appears to be so consistently related to tasks which require learning new skills and variety. Individuals with higher aptitudes have had more success in the past on tasks with these characteristics. This generalized and positive reinforcement from successful task performance had built up a preference for complex tasks and tasks containing opportunities for learning.

The question of the effects of job or task performance on the formation of job preferences has been raised by a number of investigators. Locke (1965a, 1965b, 1967, 1968) has focused on the relationship between conscious goals and intentions and task performance. In a number of laboratory and field studies, a significant linear relationship was found between success on the task and measures of task satisfaction. The major reasons for liking a task involved aspects of the individual's performance or improvement on the task. The major reasons for disliking a task involved characteristics of the task like monotony (Locke, 1965b). Locke extends the theory of task satisfaction to include ability and motivation. He found some evidence that the effects of task motivation are greater in high ability subjects than in low ability subjects (Locke, 1965a). His theory can be summarized by three propositions: (1) hard goals result in a higher level of performance or output than easy goals, (2) specific hard goals are more effective than general goals (e.g., do your best), and (3) an individual's behavioral intentions regulate his job performance and the effects of reward on subsequent performance.

Korman (1970a, 1970b) has developed a theory of work behavior that is similar to Locke's. Korman's theory is based on a consistency model that postulates that individuals engage in behaviors and are motivated to perform on a task in a manner that is congruent with their self-cognitions. Empirical tests on the theory have indicated that self-perceived ability or competence for the task enhances performance on that task if the task provides feedback on goal achievement. In addition to self-perceived competence, the expectancies that others have of a worker's competence and ability is important to task performance.

A study of college students investigated the role of these expectations on performance (Korman, 1970a, 1970b). The students were asked to indicate how they were going to perform on four creative tasks. They were then divided into a high and low expectancy condition. Each group was told that this same experiment had been previously completed by college students, and the experimenter reported a high performance record for the high expectancy group and a low performance record for the low group. An interesting finding was that the effects of the experimental manipulation were not as strong for more intelligent subjects. The results indicated higher levels of performance in the high expectancy group.

These laboratory studies support the Lawler and Porter (1967b) model that good performance or accomplishments on the job lead to extrinsic and intrinsic rewards which then lead to job satisfaction. This reward-satisfaction relationship is moderated by the worker's expectation and perception that the rewards are equitable.

In a later conceptualization, Porter and Lawler (1968a, 1968b) postulated the presence of two feedback loops through which job performance and rewards affect satisfaction and subsequent task performance. Job performance feeds back to affect perceptions of the performance-reward probability and the effort-performance probability. Performance is seen as a function of the three-way interaction of effort or motivation, ability, and role perceptions. Role perceptions are defined by Porter and Lawler as the direction of effort or the kinds of activities and behavior the individual believes he should follow to perform his job successfully.

### Summary Statements

There is a great deal of evidence illustrating the profound effect of certain individual and group variables as they relate to job design. The research performed to investigate these effects has been done predominantly in field settings.

This chapter reviewed the laboratory studies specifically dealing with and related to job design, and these studies are reported in Table 4. A broad conclusion that can be drawn from a review of laboratory studies on job design is that more research in the area is sorely needed. Further research should emphasize more systematic and comprehensive investigation of individual, group, and task variables in an effort to delineate those most salient with respect to job design issues.

(1) Laboratory studies of job design permit experimental control and systematic manipulation of relevant variables.

- (2) Laboratory studies are limited by the exclusive use of college samples and the fact that simulated jobs cannot approximate the time duration and affect of real world jobs.
- (3) The actual tasks used in most laboratory studies are too artificial to allow generalization to real world situations.
- (4) Laboratory studies which have attempted to empirically test job design principles are few in number.
- (5) Some of these studies have indicated that the assumptions underlying job redesign principles may be questionable (e.g., increasing responsibility will not always result in higher task performance).
- (6) Laboratory studies of inspection-type tasks have pointed to the complexities involved in increasing the efficiency of this operation.
- (7) To accept the proposition that self-pacing is superior to machine pacing in inspection tasks will require further investigation of a wide range of machine-paced conditions.
- (8) Individuals adopt a personal or preferred tempo for different tasks. In addition, some individuals may adapt better to repetitive tasks, differences based on differences in temperament, personality, arousal and autonomous nervous system functioning.
- (9) Laboratory studies of group behavior have not established a set of principles regarding group size, group structure, or group organization to optimize performance. However, satisfaction and motivation are inversely related to group size.

- (10) Despite the widespread advocation of the use of knowledge of results as a viable job design technique, the actual evidence for the efficacy of the approach is limited, and it is not clear if the effects of knowledge of results depend on information or motivational components.
- (11) More investigation is required about the interaction of abilities and task difficulty before general principles can be derived.
- (12) The evidence supports the proposition that intrinsic and extrinsic rewards are additive rather than subtractive.
- (13) Task expectancies and actual performance of a task affect subsequent task performance.

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#### CHAPTER VII

# INTERACTION OF GROUP AND INDIVIDUAL VARIABLES WITH JOB DESIGN

Four previous approaches have been used in examining the role of group and individual worker response to job characteristics and job design. These include urban-rural differences, work values (alienation-Protestant Work Ethic), job involvement and intrinsic orientation, and higher order need strength.

## Urban-Rural Differences

Research evidence has indicated that there are differences between urban and rural workers in their response to job characteristics and automation. As early as 1958, Faunce found in an interview study of 125 automobile workers that significantly more workers with rural backgrounds were dissatisfied with automated jobs. He also found that black workers irrespective of place of origin (North-South or urban-rural) were significantly more satisfied with automated jobs than were white workers (Faunce, 1958a, 1958b).

Katzell, Barrett, and Parker (1961), in a study of 72 whole-sale warehouse divisions located throughout the United States, found that those divisions whose situational characteristics were in the direction of a small town or rural cultural pattern had greater employee job satisfaction and superior job performance in terms of quantity of production and profitability. There was also a trend for those divisions to have lower turnover rates.

Kendall (1963), in a study of over 2600 male and female workers from 21 different plants, found that high general job satisfaction, high satisfaction with the pay received, and high satisfaction with the work itself was related to unattractive community features (e.g., slum conditions, urbanization, population density, prosperity and cost of living).

Hulin (1966a, 1966b), in a study of 300 female clerical employees, found that job satisfaction scores were negatively related to community prosperity. Hulin explains these results in terms of the prosperity of the community representing a frame of reference against which a worker evaluates his job. This theory offers an economic explanation of why urban workers are more satisfied with repetitive jobs or jobs with negative task characteristics.

A later study investigated the role of community characteristics in determining job and life satisfaction (Hulin, 1969).

Turner and Lawrence (1965) found, in a study of 470 workers from 11 industries working on 74 different jobs, that job satisfaction was positively related to job complexity in a sample of workers from factories located in small towns. Workers from urban areas expressed low satisfaction with more complex and responsible jobs and high satisfaction with repetitive jobs.

Shepard (1970), in a study of 120 assembly line workers and 143 maintenance craftsmen, found a negative relationship between the degree of job functional specialization and job satisfaction. He could not divide the sample in terms of rural vs. urban community of socialization. As strong a negative relationship was found

between job specialization and job satisfaction among workers socialized in urban settings as those who were socialized in rural settings. This research did not support the urban-rural hypothesis.

Form (1971), in a cross-cultural study of automobile workers from four countries, used father's occupation as the variable defining the urban-rural dimension. Sons of farmers were defined as rural workers and all others, urban. The only consistent differences between workers of rural and urban origins in all four countries were the greater upward occupational mobility of the rural and the higher educational achievement of the urban worker. It was found that a curvilinear relationship existed between the level of industrialization of the country and worker preference for work in a rural setting. In the least and most industrialized nations, India and U. S., workers preferred the agricultural sector, while those in rapidly industrializing nations, the Italians and Argentineans, preferred the industrial sector. In the area of job satisfaction and occupational adaptation, even though rural workers had lower rates of satisfaction, in only two instances were the differences in rates statistically significant.

A study by Wild and Kempner (1972) and Kempner and Wild (1973) investigated the urban-rural dimension in the United Kingdom. The sample consisted of 2,543 female manual workers engaged in unskilled repetitive work in 10 geographically dispersed plants in the electronics industry. The results indicated that workers from urban areas were better disposed to accept and tolerate rationalized and paced work than those from rural areas. It was also found that workers in rural areas had more favorable

attitudes toward their pay than those employed in urban areas. Furthermore, it was found that plant size significantly affected certain relationships between community characteristics and job attitudes.

Siegel and Ruh (1973) predicted from the research of Turner and Lawrence (1965) and the review of Hulin and Blood (1968) that community size would moderate the relationship between job involvement and participation in decision making. Contrary to their prediction, the correlation was actually higher between job involvement and participative decision making in the larger community when compared with the smaller community.

The Siegel and Ruh study involved 2,628 employees of six Midwestern manufacturing companies and used a composite measure of the urban-rural dimension which consisted of the size of the community in which the worker was raised, size of the community in which he currently was living, and size of the community in which he preferred to live. They generally found that the composite measure of community size moderated the relationship between job involvement and participation in decision making in a linear fashion, with the correlation between job involvement and participation in decision making significantly more positive for urban individuals. Job involvement was significantly related to participation in decision making (r = .51), community size (r = .51).21), turnover (r = .17), and education. These findings are somewhat ambiguous since the size of the community was defined on a three-item scale, which was different than earlier research which used present community size only.

Sheppard and Herrick (1972) found that workers age 40 or older who were born in urban areas with populations exceeding 50,000 were less likely to have positive job task ratings (see Turner & Lawrence, 1965) in contrast to workers born in small towns or rural areas.

Susman (1973), in a study of 26 plants (11 rural and 15 urban) and 127 jobs in the continuous process industry, did not confirm the hypothesis that only rural workers react favorably to job enlargement. He found rurals respond to greater work discretion with increased pride in job accomplishment, and urbans responded to job discretion with greater general job interest. His results indicated that current residence had a stronger influence on response to job enlargement than childhood residence. He concluded that the rural-urban variable is too crude a dimension from which to predict differential worker response to jobs.

Schuler (1973), in a study of 100 semi-skilled machine operators, found that urban or rural areas of socialization or current urban or rural residence were not related directly to job satisfaction. However, the incongruence between areas of socialization and current residence produced more job dissatisfaction than congruent combinations.

Shepard (1973) disputes Schuler's findings and presents additional evidence that among both those workers who have been classified as alienated and non-alienated, positive job structural attributes such as autonomy and freedom from control are associated with job satisfaction.

Hulin (1973) agrees that perhaps the earlier study by Blood and Hulin (1967) was deficient in two areas. First, there

were no specifications of what was meant by the concept "urban area;" and second, the assumption that city size was directly related to the intervening variable of alienation from middle-class norms could be questioned. Hulin goes on to state that it is interesting to note that when present location is used as an index of the concept of alienation, then congruent research results have been reported by Turner and Lawrence, Blood and Hulin (1967), and Hackman and Lawler (1971). In contrast, both Shepard (1970) and Schuler (1973) obtained negative results when the area of specializaton was used as a measure of the alienation variable rather than present location.

Fossum (1974) studied urban-rural differences in a laboratory-type work simulation. The study involved 37 female subjects hired by Michigan State University and 39 female subjects hired by the University of Wyoming to complete a computer coding task. The measure of urban-rural was based on whether the student's permanent address was within a standard metropolitan statistical area. There were no signifiant differences in performance between the two groups. Differences in job satisfaction were small but indicated that rural subjects were more satisfied with their pay and with performing a repetitive task over time than urban subjects. This study held task complexity constant and found that rural workers were more resistant to decreasing satisfaction with the repetitive task over time (third hour) and were more satisfied with pay and task satisfaction. The author concluded that "although the proportion of variance accounted for by socialization difference is small, the consistent rural direction for satisfaction may indicate a rural socialization effect related to job satisfaction in general" (p. 409).

Brief and Aldag (1975) tested the urban-rural background dimension as related to higher order need strength. The difference found between the urban and rural variable and need strength was in the expected direction but was not significant. This result was similar to that found by Hackman and Lawler (1971) with 207 telephone company employees where rural background was nonsignificantly related to higher order need strength.

Hulin and Blood (1968) have emphasized the importance of the urban-rural background as an indication of alienation from middle-class work norms. They did not present any direct data concerning the work attitudes of urban/rural workers to substantiate their contentions. Recently, Ace, Grean, and Dawis (1972) have directly measured the work attitudes of over 8,000 high school students. They also correlated their work attitude questionnaire with the variables of sex, age, education, socioeconomic status, and place of residence. The results indicated that there was a very low relationship among these demographic variables and work attitudes except for the differences between male and female high school students. As such, no support was given to the Hulin and Blood proposition that the urban-rural distinction would result in differences in work attitudes. The consistent finding was that females preferred contact with people, while males tended to be more work oriented.

The difference between males and females also has some implications for job design and the differential selection by sex into occupations having different characteristics. The data

seems clear that even before individuals in our society begin the work role, they have some definite attitudes concerning preferences for type of work and that males and females have somewhat different orientations. The females seemed more apt to select those jobs where personal relationships and people are more important, while the males tend to be oriented more toward work and getting the job done.

The basic problem for job design is that while we can discuss group differences such as those between the males and females, there is still obviously a large overlap in work attitudes between the sexes. Some females will be very work oriented, while conversely, some males will prefer a people orientation. It is interesting to note that while one would assume for some of the current social commentary that the modern youth has lost their work orientation, the data does not support that contention.

Nor does the data support the proposition that there now has been a drastic shift in the work orientation of females such that it now exactly matches the male attitudes.

On a theoretical level, Sales (1971) has proposed a theory dealing with individual differences and need for stimulation and related the theory to urban-rural differences. Sales proposes that some individual's nervous systems tend to reduce stimulus inputs while others tend to augment these objective inputs. Eysenck (1955) has shown that individuals who reduce stimuli are more likely to be extraverts. This ties in nicely with the consistent finding that extraverts are those who tend to leave an organization and perform less well on simple vigilance-or repetitive-type tasks. Reducers are also those who look for

more complex and interesting social situations. In a laboratory study of college students, Sales, Guydosh, and Iacono (1974) found that reducers became bored and received less enjoyment from simple stimuli. The urban subjects, those raised in an urban environment, tended to be reducers. Therefore, they would be ones who would seek more novel or more complex stimuli.

The finding that the subjects raised in a rural setting were less disturbed by or received more enjoyment from a simple stimuli does not fit well with the conceptualizaton advanced by Hulin and Blood (1968). Hulin and Blood would maintain that the urban workers would prefer the less complex jobs, while the rural workers would prefer more complexity and responsibility in their jobs. At this point, there is no way to reconcile these different viewpoints, and further research is required to see if, indeed, the laboratory studies can be related to observations from survey research. Table 5 presents a review of studies related to the urban-rural dimension.

#### Work Values

Work values have been conceptualized as running the gamut from "alienation" to agreement with the Protestant Work Ethic. Blood and Hulin (1967) postulated the construct "alienation" to explain differential worker response to job enrichment. The construct is conceived as a continuum running from integration with middle-class norms to alienation from middle-class norms. At the integrated end of the continuum are workers who have personal involvement with their jobs and goals of upward mobility associated with the American middle-class and the Protestant Work Ethic. At the alienated end of the continuum, workers

Table 5
Urban-Rural, Community, and Cultural Variables

Type of Worker or Company	N	Instrument	Major Findings	Reference
High School Students	8,000	Work Attitude Questionnaire.		Ace, Graen, & Dawis (1972)
Hourly Manufacturing Employees	* 131	Questionnaire which included a revised version of the Yale Job Inventory, the Leader Behavior Description Questionnaire, and Ghisetti Self-Description Inventory.	and were more work oriented. The common suggestion that adherence to Protestant Ethic ideals should be associated with strong higher order needs was supported. Also, age was related to Protestant Ethic, but urbanization of area of socialization was not	Aldag & Brief (1975b)
Fishermen and Sugarcane Cutters in a West Indian Village	40	Interview, Projective Questions.	related. Organization of both culture and personality systems is the final product of three independ- ent factors: environment, institutional determinants, and organismically-based psychological needs.	Aronoff (1967)
White and Blue Collar Workers Representing 21 Different Plants in Eastern Half of United States		l4 response variables were used including the Job Descriptive Index (JDI), the General Motors Faces Scale, and a Preparation for Retirement Index.	It was predicted that workers in communities fostering integration with middle- class norms should report higher satisfaction on highly skilled jobs. Alienated workers should report lower satisfaction on highly skilled jobs. Pay should have a stronger effect on the satisfaction of alienated workers, and these workers would be more likely to look for other work after retirement. It was found that these predictions were applicable to blue collar workers but not to white collar workers. It was hypothesized that these findings were not applicable to the latter since the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present	
Mill Employees	98	Interview and observation.	response variables measured Community structure and expectation are strong determiners of job satisfaction.	Chadwick & Jones (1970)
Automobile Engine Plant	125	Interviews asking workers to compare their last previous non-automated job with their present job in terms of job content, working conditions, patterns of social interaction, and work satisfaction.	Increased automation can result in social isolation, alienation from work, and increased work tensions; however, this may be characteristic of the automatic factory. Rural workers dissatisfied with automated jobs.	Faunce (1958a, 1958b)
Automobile Workers from Four Countries	1052	Interviews were used to gather data for participation and adaptation in the factory, labor union, family, neighborhood, community, and nation.	No systematic difference between rural and urban workers were revealed, indicating that workers . from different social and cultural backgrounds adapt rapidly to the occupational and social systems of industrial society (indus- trial man-hypothesis).	Form (1971)

Type of Worker or Company	N	Instrument	Major Findings	Reference
Automobile	1092	Interviews were used	Most workers believe that	Form (1973a)
Workers from		to investigate three	their work integrates their	
Four Countries		areas of work satis-	lives, they prefer to work	
		faction: general work	in the industrial sector,	
		satisfaction, satis-	and they report that their	
		faction with factory	jobs are satisfying. Small	
		or industrial employ-	and inconsistent differences	
		ment, and satisfaction	were found in the three	
		with the specific	areas of work satisfaction	
		physical and social	according to the degree of	
		attributes of the jobs.		
			and degree of plant mechanization.	
Automobile	1092	Interviews were used	In the more industrialized	Form (1973b)
Workers from	1092	to obtain data on	countries, skilled workers	FORM (1973B)
Four Countries		worker involvement in	participate more in work-	
		the family, work	related social systems and	
		group, union,	in systems that extend	
		neighborhood,	beyond family and neighbor-	
		community, and nation.	hood. The increasing dif-	
			ferences in participation	
			with the working class	
			which accompany industrial-	
		•	ization result from a	
			greater ability to link	
			other systems to the	
	1000		solidary work groups.	11075
Automobile	1092	Interviews and anomie	Anomie observed was related	The state of the s
Workers from		scales constructed to	to the extent of industrial-	
Four Countries		measure the amount of societal anomie	ization; but place in the	The state of the s
	1 8 8 1 1 10	workers perceived.	skill hierarchy and pattern of system involvement were	
	Victoria.	workers perceived.	associated with anomie	
			differently in each	
			country. In the less	
	* -		developed countries, beliefs	
			concerning anomie were not	
			related to skill level or	
			pattern of .system involve-	
			ment, but to political	
		1000	ideology.	
Female Under-	76	Semantic differential	Subjects with a rural	Fossum (1974).
graduate Data		satisfaction scales	socialization tended to be	Control of the Contro
Coders		using bipolar	more satisfied with their	
		adjectives to describe degrees of task and	pay and with performing a . repetitive task than were	
		work satisfaction.	urban-socialized subjects.	
White Collar	1468	Questionnaire measur-	In the white collar sample,	Friedlander (1966)
Technical		ing three types of	low performers were	
Personnel and		motivation: (1)	motivated by the social	
Blue Collar		social environment,	environment and to a lesser	
Workers		(2) intrinsic self-	extent by recognition	
		actualizing work, and	through advancement. In	
		(3) recognition	the blue collar sample, no	
		through advancement.	significant relationships	
			were found between any of	
			the motivational measures	
			and job performance.	We almost a decided
Telephone Company	208	Questionnaires in-	The relationship between job	
Employees	1 1 1 1 1	vestigating the	level (i.e., jobs high on	(1971),
		following job dimen-	the core dimensions of	
		sions: variety, autonomy, task	variety, autonomy, task identity, and feedback) and	
		identity, feedback,	satisfaction was found to be	
		dealing with others,	high for rural workers and	
		and friendship	low for urban workers.	
		opportunities.		
Female Clerical	300	Specific company	Analysis of the data showed	Hulin (1966a, 1966b)
lorkers	Art and the	oriented satisfaction	that: (1) average satis-	the factories
		questionnaire directed	faction scores and group	
	1000	toward nine different	productivity were	
	- 1	content areas.	correlated in general, (2)	
		opini por militar o militar	satisfaction scores were	
		MARK CONTRACTOR CONTRACTOR	negatively related to the	
			prosperity of the communi-	
			ty, and (3) pay satis-	
			faction scores were more	
			negatively related to the	
the state of the s			prosperity of the	
			mammared by their construction	
			community than were other	
			community than were other aspects of job satisfaction (e.g., working conditions,	

		Table 5 (Co	nt'd)	
Type of Worker		1 100	T	
or Company.	N	Instrument	Major Findings	Reference
Male and Female White Collar	470	Job Descriptive Index,	Workers' satisfaction with	Hulin (1969)
Workers from Two		General Motors Paces Scale.	community characteristics affected their satisfaction	
Different		Scare.	with pay, satisfaction with	
Communities			job in general, and satis-	
			faction with life in	
			general.	
Review article			The argument for job en-	Hulin & Blood (1968)
			largement as a means of	
			motivating workers, de- creasing boredom and dis-	
			satisfaction, and increasing	
			attendance and productivity	
			is valid only when applied	
			to certain portions of the	Supplied to the second
			work forcewhite collar	and ground with
			and supervisory workers, and non-alienated blue	
			collar workers. Job en-	
			largement hypothesis should	
			predict behavior of white	
			collar workers and rural	
			blue collar workers but	
			should not predict behavior	
	The state of		of the urban blue collar . workers. Therefore, this	
			is a definite job size, job	
			satisfaction, and plant	
			location interaction.	
Warehouse	2520	47 item multiple	Warehouse divisions whose	Katzell, Barrett,
Production .	•	choice questionnaire	situational characteristics	& Parker (1961)
Norkers		covering 10 job satis-	are in the direction of the small town (rural) cultural	
		faction categories.	pattern have greater	
		est of the constitution	employee job satisfaction	
			and superior job perform-	
			ance (in terms of quantity	
			of production and profit-	
			ability). There is also	
			a trend for these divisions	
			to have lower rates of turnover.	
Unskilled Female	2500	Interviews and forced	People working in urban	Kempner & Wild (1973)
Manual Electronics		choice questionnaires.	areas were better disposed	
Workers			to tolerating paced work	
			than those from rural areas.	
			Also workers' age, marital status, and length of	
The Control of the Local Day I		SELECTION OF THE RESERVE	service moderated the rela-	
		Class States States - Not 2	tionship between job	
		CAL STURBERS		
	late Transferi	rang statistics of the second control of the	tionship between job factors (e.g., adequate wages, security of employ-	THE CONTRACTOR
	Late Tensilvat at dis	1	tionship between job factors (e.g., adequate wages, security of employ- ment) and job satisfaction.	DAK CARCAL SALA SALAM SALAM SECONDAR
Plant Employees		Attitude measures of	tionship between job factors (e.g., adequate wages, security of employ- ment) and job satisfaction. Canonical analysis of	Kendall (1963)
Plant Employees	642 .	satisfaction with	tionship between job factors (e.g., adequate wages, security of employ- ment) and job satisfaction. Canonical analysis of available date indicated	
Plant Employees		satisfaction with specific aspects of	tionship between job factors (e.g., adequate wages, security of employ- ment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance	
Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employ- ment) and job satisfaction. Canonical analysis of available date indicated	
Plant Employees	642 .	satisfaction with specific aspects of	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and	
lant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data,	
Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude	
Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related	
Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and	
Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay	
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Plant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of	
lant Employees	642 .	satisfaction with specific aspects of the job (e.g., work,	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for	
	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.	scended newson of all and colors
White-Collar	642 .	satisfaction with specific aspects of the job (e.g., work, pay, etc.).	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group	
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose	scender were of all and red ord
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group	scender were of all and red ord
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs	scended newson of all and colors
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held techni-	scended newson of all and colors
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-low-ment of the low-cal jobs. Also, in the low-	scended newson of all and colors
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive	scended newson of all and colors
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found be-	scender were of all and red ord
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income. In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found between intrinsic job orienta-	weeder were of a
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction.  Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found between intrinsic job orientation and community size.	scender were of all and red ord
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income. In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found between intrinsic job orienta-	
Plant Employees  White-Collar Employees	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found between intrinsic job orientation and community size. No differences in job	Service of the servic
White-Collar	642 females	satisfaction with specific aspects of the job (e.g., work, pay, etc.).  Questionnaires involving the ranking of six intrinsic and	tionship between job factors (e.g., adequate wages, security of employment) and job satisfaction. Canonical analysis of available date indicated that: (1) high performance along with high absences is associated with a combination of satisfaction and personal background data, (2) a global attitude toward the job is related to community features, and (3) satisfaction with pay is higher in communities of relatively low prosperity; suggesting the role of the community as a standard for evaluating income.  In the low-salaried group (\$10,000) employees whose fathers held unskilled jobs were less intrinsically oriented than employees whose fathers held technical jobs. Also, in the low-salaried group, a positive relationship was found between intrinsic job orientation and community size.  No differences in job orientation were found in	Service of the servic

Type of Worker	100000000000000000000000000000000000000	Table 5 (Con		
or Company	N	Instrument	Major Findings	Reference
Theory and Lab Study College Students	51	Measure of auditory thresholds.	Students with high auditory thresholds who reduce incoming stimuli were unresponsive and bored with simple stimuli. They also were more likely to drink	
100			coffee and come from urban settings.	
Semi-skilled Machine Operators	100	Brayfield-Rothe Questionnaire.	Area of socialization or worker residence was not related to job satisfaction as measured by the ques-	Schuler (1973) See also Hulin (1973) and Shepard (1973)
	and the		tionnaire. There was an interaction between area of socialization and current residence which affected job satisfaction. The in-	
		ganded_casedetmadel range ==madel	congruent combinations of rural residence and urban socialization and urban residence and rural social-	100 (100 (100 (100 (100 (100 (100 (100
		List of the time of the second	ization produced more job dissatisfaction than congruent combinations. Research is commented on by Hulin and Shepard.	
Oll Refinery		18 item, 5 point	A measure of urban or rural	Shepard (1970)
Workers	109	Likert Scale from the	community of socialization	
Assembly Line		Brayfield and Rothe	of the worker did not affect	
Workers Maintenance	120	Job Satisfaction Index. Three indexes	the relationship between functional specialization	
Craftsmen	143	investigating	and job satisfaction. The	
Clarcomen	1	alienation from work.	conclusion is that job	
			specialization is not re-	
			ceived negatively by only	
		of an area of the son of	certain segments of the work force but is a more	
			general phenomenon.	
Midwest	398-per-	Questionnaires in-	Job involvement was	Siegel & Ruh (1973)
Manufacturing	formance	volving job involve-	significantly correlated	
Organizations	data 238-absen-	ment, participation in decision making,	with participation in decision making, community	
	tecism data		size, and turnover. The	
	1662-turn-	community size.	correlation between partici-	
	over data	The second of the second	pation in decision making	
	2530-educa- tion data	and the second second	and job involvement was significantly greater for	
	2628-part-		individuals with more educa-	
	icipation		tion. Also, the correla-	
	in decision		tion between participation	
	making data		in decision making and job	
	nity size		involvement was signifi- cantly greater for more	
	data	•	urban individuals than for	
	-		less urban individuals.	
Jrban, Blue and	593	Job Description Index	Indices of job scope (e.g.,	Stone & Porter (1973)
White Collar		and an instrument	variety, autonomy) were positively and significantly	
Telephone Employees		designed to elicit ratings of jobs on each		
cult to leas		of eight character-	the work itself. Also,	. 1. 10
		istics.	urban employees who worked	
			on jobs of larger scope did	
			not experience greater dissatisfaction with work	
*			(which is contrary to the	
		resident en en el composition de la composition della composition	Hulin and Blood (1968)	
			findings).	Guerra (1972h)
Continuous	329	Questionnaire measuring	Populations of rural bred-rural resident, rural	Susman (1972b)
Process Industry		attitudes related to intrinsic work	bred-rural resident, rural bred-urban resident, and	
Workers		motivation.	urban bred-urban resident	and the same and it
			all responded favorably to	mean both could be
	1	or the state of th	job enlargement, pride of . accomplishment, and interest in job.	

Type of Worker or Company	N	Instrument	Major Findings	Reference
Continuous	462	Questionnaire measuring		Susman (1973)
Process Industry Workers		general job interest, pride in job accom- plishment, and instrumental work	hypothesis that rural employees react favorably while urban employees react unfavorably to job enlarge-	
		orientation.	ment. These results in- dicate that present residence has a stronger	
			influence on job enlargement than does childhood residence. People of dif- ferent cultures and back- grounds react differently to	
			job enlargements, but the differences cannot be attributed solely to urban or rural residence.	
ion-Supervisory	3800	Paper and pencil	In neither company was .	Taylor (1971b)
Employees of an	*	questionnaire in-	education, tenure, or urban	
Oil Refinery and		volving leadership.	vs. rural background found	
an Insurance Firm			to be related to supervisory or peer leadership, or to the group process.	
Industrial	470	Requisite Task	Workers from small town	Turner & Lawrence
Workers		Attribute Index.	settings responded favorably	(1965)
			(in terms of high satis-	
			faction and low absence rates) to jobs that were	
			more complex, had more	
			responsibility, variety,	
			etc. Workers from cities	
			indicated no relationship	
			between task attributes and	
			attendance and responded with low satisfaction to	
		and the second second of the	supposedly desirable job	
			attributes and with high	
			satisfaction to "undesir-	
			able" attributes such as	
Female Telephone	80	Questionnaires in-	repetitiveness. High vs. low "higher order"	Wanous (1973, 1974)
Operators	80	vestigating urban vs.	need strength is the best	Wallous (1973, 1974)
		rural background,	way to measure individual	
		Protestant Ethic, and	differences as they are	
		higher order need	relevant to job design.	
		strength. Job satis- faction was measured	The Protestant Ethic showed some usefulness as a	
		with the Minnesota	moderator, but urban/rural	
		Satisfaction	background differences did	
		Questionnaire.	not affect employee reac-	
			tions to job characteris-	
Gallup Poll	1488	One question: "On the	Major findings included:	Weaver (1974)
Surveys	699	whole, would you say	1) There is little important	
	1403	you are satisfied or	variation among the reports	
	711	dissatisfied with the	of job satisfaction at	
		work you do?"	different levels of educa-	
			tion. 2) Reports of job satisfaction are higher for	
			employees in professional,	
		Commence Spire Copyright	farm, and skilled blue	
	1 6 2 3	telled to user and	collar categories than for	
		Catalog states to alleg a person	unskilled workers. 3)	
			Blacks report levels of job	
		and the first term of the firs	satisfaction that are lower than those of whites. 4)	
		Service of	There is no consistent	
		The part has the Market Ball	pattern of association	THE RESERVE OF THE PARTY OF THE
The state of the s		the state to the state of the	between employee age and	
VISA EL DON	100	1	job satisfaction. White collar workers are	Weaver (1975)
		Select the one	more concerned than are blue	
	1500	absenstantetta that	more concerned than are blue	
White and Blue Collar Workers	1500	characteristic that	collar workers about in-	
	1500	would be most	collar workers about in- trinsic job characteristics,	
	1500		trinsic job characteristics, but the contention that blue	
	1500	would be most 'preferable in a job: 1) high income, 2) no danger of being fired,	trinsic job characteristics, but the contention that blue collar workers are more	i swa
	1500	would be most preferable in a job: 1) high income, 2) no danger of being fired, 3) short working hours,	trinsic job characteristics, but the contention that blue collar workers are more likely to prefer extrinsic	and the second s
	1500	would be most 'preferable in a job: 1) high income, 2) no danger of being fired,	trinsic job characteristics, but the contention that blue collar workers are more likely to prefer extrinsic	

Table 5 (Cont'd)

Type of Worker or Company	N.	Instrument	Major Findings	Reference
Production Workers	300	Not reported.	Workers who were likely to be "rate-busters" (produce above the group standards)	Whyte (1955)
ag'(0) ar	e ad	( Field Watsh.	were those workers with rural or small town back- grounds, whose fathers had	perioval era
e coo sus es		a feugraphico	been entrepreneurs or farmers, and who tended to look upward toward their	id lo ensom a
Ily interest	G 935 V	SOBETAL TERMS	parents for authority sanctions rather than toward their peer group. "Quota	o dampinos eni
udna oyeoneo impi	martey wate to	is any materior	restricters" were more likely to have been reared in large cities and have come from working-class families.	es setal
Female Manual Workers	2543	5-part questionnaire investigating attitudinal, bio- graphical, and work	Workers from urban-type communities are better dis- posed to accepting rationalized and paced work	Wild & Kempner (1972)
no elembro de	guesa Enl pa	need information.	than those from rural areas. Also, community factors affect workers' job attitudes through the	Cacheviho: on
; (28038799)	ondi 1	level limit.	creation of a frame of reference within which judgments are made.	mais scheoops as

productively, speed the engine of the service of the service of the service of

are involved only instrumentally with their jobs. The job is a means of providing for extra-occupational activities and goals. The concern of these workers is monetary. They are only interested in their pay with a minimum of personal job involvement.

This conceptualization integrates the sociological concepts of anomia with alienation. Anomia refers to the degree of normlessness of social systems or sub-systems on a group basis. On an individual basis, it may be possible to place individuals on an anomia continuum representing their level of interpersonal integration. The continuum would consist of an individual with a pervasive sense of belonging at the integrated end of the scale, while at the other end would be an individual who is alienated from others (Meier & Bell, 1959). Some have postulated that anomia results from a lack of opportunity to achieve life goals and the obstacles to their achievement are rooted in social and cultural conditions. Meier and Bell (1959) found that the following factors were related to anomia: occupation, education, income, age, class identification, participation in formal organizations and in informal groups, social mobility, marital status, and religious preference.

This line of investigation has been critical of job design as Hulin and Blood (1968) have suggested that these individual differences in work values will moderate the effects of job enrichment and that only workers with middle-class values will respond favorably to enriched jobs.

Other researchers have looked at the relationship of work values to job performance. Whyte (1955), in an early study of productivity, specifically "rate busters" and "quota restricters",

found that rate busters who produced above the group standard were from rural or small town backgrounds: their fathers were farmers; they were Protestant and Republicans; they viewed their parents rather than the peer group as authority figures. Quota "restricters" were more likely to have been reared in urban areas, to come from working-class families, to be Catholic, Democratic, and a member of a boys gang as a youth. The results are interpreted as indicating that the "rate busters" rejected the productivity norms established by their peer groups and accepted the norms of management.

Blood and Hulin (1967), in data collected from 1900 male workers located in 21 plants in the Eastern United States, found that in those communities that were most alienated from middle-class norms, the correlation between job level or skill and work satisfaction was -.50, while in the most integrated community, the correlation was +.40. The following predictions were conformed for blue-collar workers. Alienated workers reported lower satisfaction on highly skilled jobs, pay had a stronger effect on the satisfaction of alienated workers, and integrated workers reported high satisfaction in highly skilled jobs and valued and planned for retirement.

Blood (1969) related agreement with the Protestant Ethic to job and life satisfaction using a sample of 448 Air Force airmen and non-commissioned officers. Though none of the correlations were large, that data showed that agreement with the Protestant Work Ethic was positively related to job and life satisfaction. The job satisfaction controlled by this factor was reported to be independent of that controlled by other variables.

Aldag and Brief (1975b), in a questionnaire study of 131 hourly workers from a Midwestern manufacturing plant, conducted a study to test the hypothesis of Blood (1969) that agreement with the Protestant Ethic was related to differential affective responses toward job characteristics, higher order need strength, and perceptions of task characteristics and leadership behavior. Age was positively related to Pro-Protestant Ethic score, but other biographic variables like urban-rural area of socialization was not related. Specifically, significantly positive relationships were found between pro-Protestant Ethic and higher order need strength and negative relations for non-Protestant Work Ethic and higher order need strength. Non-Protestant Work Ethic was negatively related to all perceptions of task dimensions (skill variety, task identity, task significance, autonomy, and feedback from the job). However, perceptions of task dimensions were not positively related to pro-Protestant Ethic scores and were, therefore, independent of the Protestant Ethic variable. These inconsistencies in the data cast doubt on the causal relationship of Protestant Ethic to work responses.

Stone (1975), in a study of 149 enlisted Naval personnel, found a positive (.50) relationship between job scope and satisfaction with the work itself as measured by the Brayfield-Rothe Job Satisfaction Index. This is a consistent finding in other studies that satisfaction in linearly related to measurements of the job characteristics.

Stone developed a questionnaire measure of job scope which was derived from the measurement of the job characteristics of variety, autonomy, task identity, and feedback. The questionnaire

which is administered to employees is conceptually similar to Turner and Lawrence's (1965) Requisite Task Index. The instrument can also be used by independent raters such as supervisors. As in previous studies, the correlation between employees and supervisor ratings was .63.

Stone found that moderation by the Protestant Ethic Scale from the Survey of Work Values (Wollack, Goodale, Wijting, & Smith, 1971) did not change the relationship between job scope and satisfaction with the work itself. There was a positive relationship between agreement with the Protestant Ethic value system and the level of satisfaction with the work itself. For the total sample, the Protestant Ethic Scale correlated .43 with satisfaction with the work itself.

The prediction of Hulin and Blood (1968) was not supported, as Stone did not find a negative relationship between job scope and satisfaction with the work itself for the so-called alienated subsample (those in the lower third of the Protestant Ethic Scale). Based upon these findings, it would appear that a job enrichment approach could be used with all classifications of workers, not only those who are considered integrated with middle-class norms and values, the Protestant Ethic. In another study of urban blue-collar workers from 16 craft jobs in a telephone company, Stone and Porter (1973) found taht job variety and autonomy were positively related to satisfaction with the work itself. Workers in jobs larger in scope did not experience greater dissatisfaction. In fact, job scope correlated highly with the Job Descriptive Index-Work Itself Subscale in this urban, blue-collar sample.

Taveggia and Hedley (1975) tested three hypotheses regarding the relationship of job specialization to worker dissatisfaction. The three positions are: (1) an unconditional relationship, (2) a stronger relationship among workers committed to middle-class values, and (3) a stronger relationship among alienated workers. He used a sample of 5,274 industrial workers from six factories in the United Kingdom. His measure of job specialization included five questions involving relief opportunities, work variety, physical movement, slack periods, and work speed. Middle-class values were measured by three questions involving central life interests and whether a worker was more interested in his home or job. Two five-point rating questions measured overall satisfaction with the job or the company.

The results were very inconsistent, and overall relationships indicated a weak positive unconditional relationship between job specialization and worker dissatisfaction regardless if the worker was alienated or held middle-class work values.

Further statistical analyses indicated that relief opportunities and slack periods were not related to satisfaction.

However, work speed was related to job and company dissatisfaction for alienated workers only. Work variety was related to job dissatisfaction for alienated workers only. The results on work movement were inconsistent. The authors appropriately conclude that "correlates of job specialization relate in different ways and in varying degrees to worker dissatisfaction" (p. 13).

A significant positive relationship between the satisfaction with the work itself and the job scope has been consistently found in numerous other studies including Alderfer (1967),

Armstrong (1971), Blauner (1964), Centers and Bugental (1966), Fullan (1970), Hackman and Lawler (1971), Porter (1962), Shepard (1969, 1970, 1973), Stone and Porter (1973, 1975), and Svetlik, Prien, and Barrett (1964).

This relationship seems to hold for most segments of the work population regardless of their position on the alienation-integration continuum. Studies of work values including alienation and the Protestant Work Ethic are reported in Table 6.

## Job Involvement-Intrinsic Orientation

Herzberg's two-factor theory of work motivation has generated a multitude of research studies. We will not attempt to review this extensive body of literature, nor the pros or cons of the "Herzberg controversy." Reviews of the research literature in this area are provided by Bockman (1971) and Kaplan, Tausky, and Bolaria (1969). Herzberg's basic concepts, methodology, and the generality of his findings have been widely disputed by some investigators (Bieshevvel, 1975).

#### Intrinsic-Extrinsic Job Orientation

Rather than focusing on context and content factors contained within the task, Saleh (1971a, 1971b, 1971c) has postulated an individual attribute construct of intrinsic-extrinsic job orientation. Intrinsically oriented individuals (IO's) are those who emphasize the actual performance of a task. They are concerned with the job challenge and their accomplishments. Extrinsically oriented individuals (EO's) are those who emphasize the environmental aspects of their jobs. They are concerned with security, working conditions, and supervision rather than challenge and accomplishment. It was found that IO's were relatively more

Table 6
Work Values (Alienation-Protestant Work Ethic)

or Company	N .	Instrument	Major Findings	Reference
Hourly	131	Questionnaire which	The suggestion that adherence	
	131	included a revised	to Protestant Ethic ideals	1 11111
Manufacturing			should be associated with	
Employees		version of the Yale		
		Job Inventory, the	strong higher order needs wa	
		Leader Behavior	supported. Also, age was re	To be a second to the second s
1		Description	lated to Protestant Ethic	
		Questionnaire, and	adherence, but urbanization	
		Ghiselli Self-	and areas of socialization w	ere
	115	Description Inventory.	not related. Printers and chemical worker	s Blauner (1964)
Printers (Craft	115	Survey	most integrated alienation.	s Diaunei (1904)
Technology)		A STATE OF THE STA	highest among auto and	STATE OF STA
Textile Workers	400		textile workers. Technology	
(Machine-Tending			determines alienation.	
Technology)	180		determines affenacion.	
Automobile	180			
Workers (Assembly-				
Line Technology)	78	The state of the s	10 2 11 2 12 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	
Chemical Workers	76			
(Continuous-				
Process Technol-				
044)	112	Job Descriptive Index,	Agreement with the	Blood (1969)
Airmen and	448		Protestant Ethic is directly	
Noncommissioned		General Motor Faces	related to satisfaction, and	
Officers from USAF		Scale, and 8-item	agreement with Non-	
		scale measuring agree-	Protestant Ethic items is	
		ment with Protestant	inversely related to satis-	
		Ethic.	faction. This implies that	
			the more a worker agrees	estas e Me ue la
			with the Protestant Ethic.	
			the more he will be	
			satisfied in his work and	
The state of the s		A THE RESIDENCE OF THE PARTY OF	with life in general.	
			Persons respond to their	Blood (1973)
Graduate and	386	Job Orientation	work situation according to	22000 (2370)
Undergraduate		Inventory.	their personal hierarchy of	
Students			work rewards rather than	
Exercise Boys		waste of the state of the state of	responding to the absolute	
Sorority Members			level of one dimension with-	
Penitentiary			out regard to other rewards.	
Inmates and		net numer appropri	but regard to other reading.	
White and Blue	1900	14 response variables	Blue collar workers in	Blood & Hulin (1967)
Collar Workers	1900	were used including	communities fostering in-	Dicou a marin (1507)
		Job Descriptive Index	tegration with middle-class	
Representing 21 Different		(JDI), the General	norms report higher satis-	
		Motors Faces Scale,	faction on highly skilled	
		motors races scare,		
Plants in the		and a Dunnamation for		
Eastern United		and a Preparation for	jobs, and alienated blue	
		and a Preparation for Retirement Index.	collar workers report lower	
Eastern United			collar workers report lower satisfaction on highly	
Eastern United			collar workers report lower satisfaction on highly skilled jobs. Also, pay had	and the second
Eastern United	rasoni		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the	
Eastern United	MOSCAL EKT C		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated	CUE CONTRA
Eastern United	MOSCAL EXT ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings	edia regionale.
Eastern United	rasoni Est		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white	edd oddid w Bris
Eastern United	roscol sec ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was	ed a chid w lens
Eastern United	rasoni est ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may	el la controll els control et lene la control et lene
Eastern United	rasoni eni ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that	elle socialis de chite se bee de l'asbanches de l'asbanches
Eastern United	roscol est () blastr esp (2		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations	in contain ele camp w enc ele tampa shot ele compa
Eastern United	roscol est () blaste esp ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white	edd ownow bees for tanking her
Eastern United	resont est ti esp ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may	
Eastern United	resent ent c espect		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different	elia sociali di chia w bas de lespivebol di coccas sie scresocre
Eastern United	roscol est co sinsing esp (s		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to aliena-	E IN SOUTHER SIN SANDAY PRO SIN SANDAY POL SIN SANDAY MC ANALLEANS
Eastern United	resont est () esp ()		collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present	e in contain ins of child within the languages sin a choose and successions
Eastern United States	623	Retirement Index.	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured.	entrale ton
Eastern United States Job Incumbents,	623	Retirement Index.	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that	Dubin, Porter,
Zastern United States Job Incumbents, Peers, and	623	Ratings of eight job characteristics (e.g.,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than	Dubin, Porter, Stone, & Champoux
Zastern United States Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share	Dubin, Porter,
Zastern United States		Ratings of eight job characteristics (e.g.,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual	Dubin, Porter, Stone, & Champoux
Zastern United States Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors explain this, in part, as a	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors explain this, in part, as a result of the "alienation"	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors explain this, in part, as a result of the "alienation" of industrial workers which	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors explain this, in part, as a result of the "alienation" of industrial workers which accompanies their perception	Dubin, Porter, Stone, & Champoux
Zastern United States  Job Incumbents, Peers, and Supervisors in a		Ratings of eight job characteristics (e.g., variety, autonomy,	collar workers report lower satisfaction on highly skilled jobs. Also, pay had a stronger effect on the satisfaction of alienated workers. These findings were not applicable to white collar workers, and it was hypothesized that this may be so due to the fact that the different occupations involved in the white collar classification may generate a different susceptibility to alienation than the present response variables measured. The features of jobs that incumbents rate lower than the rating by others share the characteristic that they link the individual with some major feature of his own work and work environment. The authors explain this, in part, as a result of the "alienation" of industrial workers which	Dubin, Porter, Stone, & Champoux

AN CAMMANIE	N	Instrument	Major Findings	Reference
or Corpany	1092	Interviews and anomie	Anomic observed was related	
Workers from	1092	scales constructed to	to the extent of industrial-	
AND THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS		measure the amount of	ization, but place in the	
Four Countries		societal anomie	skill hierarchy and pattern	
			of system involvement were	
		workers perceived.	associated with anomie	
		The restricted the behaviorities	differently in each	
			country. In the less	
			developed countries, anomie	
			was not related to skill	
			level or pattern of system	
			involvement, but to	
		•	political ideology.	1
Canadian Manual	1491	Self-administered	Oil workers are much more	Fullan (1970)
Workers from		questionnaire in-	integrated in regard to the	
		vestigating worker	five areas investigated	
Printing,		integration in five	than are auto workers, with	
Automobile, and			printers falling in between	
Oil Industries		areas: (1) relation-		
		ship with fellow	These findings are ex-	
		workers, (2) rela-	plained in terms of the	
		tionship with first	differences in the socio-	
		line supervisors, (3)	technical systems involved	
		labor-management	(craft, mass, and continuous	
		relations, (4) status	process production systems)	
		structure of the	Process Process of a comp,	
		organization, and (5)		
		evaluation of the		
		company.		Hulin & Blood (1968)
Review Article			In investigating the	Hully & Blood (1968)
			effects of alienation to	
			work satisfaction, one	
			should expect the relation-	
			ship of job level to work	
			satisfaction to change	
			linearly from positive	
			through zero to negative as	
			one moves from nonalienated	
			to alienated communities.	
Review Article			Studies in the United States	Kaplan (1973)
•			and abroad on alienation	
			from work, job complexity,	
			and technology indicate	
			that while there may be some	
			negative effects associated	
		A CONTRACT OF THE PARTY OF THE	with these variables in the	
			workplace, there is little	
			evidence to support the	
			contention that negative	
			contention that negative work experiences are	
			contention that negative work experiences are carried beyond the work-	
			contention that negative work experiences are carried beyond the work- place and are transferred	
			contention that negative work experiences are carried beyond the work- place and are transferred into generalized feelings	
Corout or Pressure	150		contention that negative work experiences are carried beyond the work- place and are transferred into generalized feelings of alienation.	
Computer Personnel	150	57 item questionnaire	contention that negative work experiences are carried beyond the work- place and are transferred into generalized feelings of alienation. Level of self-estrangement	Kirsch & Lengerman
Clerical Workers	150	measuring powerless-	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively	Kirsch & Lengerman
	150	measuring powerless- ness, meaninglessness,	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of	
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate	
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-	
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate	
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-	
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c)	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-ness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of .control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine opera-	(1972)
Clerical Workers	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-ness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical	(1972)
Clerical Workers Machine Operators		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of .control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine opera-	(1972)
Clerical Workers Machine Operators	150	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-ness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented super-	(1972)
Clerical Workers		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work	(1972)
Clerical Workers Machine Operators  Electronic Blue		measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work pressure as opposed to product-oriented supervision	(1972)  Klein & Ritti (1970)
Clerical Workers Machine Operators  Electronic Blue Collar	1500	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.  Fixed Alternative Questionnaire.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work pressure as opposed to product-oriented supervision Lower skill level of	Klein & Ritti (1970)  Kornhauser (1965)
Clerical Workers Machine Operators  Electronic Blue Collar	1500	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.  Fixed Alternative Questionnaire.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work pressure as opposed to product-oriented supervision was kill level of workerpoorer mental	Klein & Ritti (1970)  Kornhauser (1965) See also McWhinney
Clerical Workers Machine Operators  Electronic Blue Collar	1500	measuring powerless- ness, meaninglessness, lack of promotion opportunities, and self-estrangement.  Fixed Alternative Questionnaire.	contention that negative work experiences are carried beyond the work-place and are transferred into generalized feelings of alienation.  Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerlessness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion. 4% of computer personnel, 48% of clerical and 64% of machine operators experienced work alienation.  Employee-oriented supervision was associated with high social cohesion and low perception of work pressure as opposed to product-oriented supervision Lower skill level of	Klein & Ritti (1970)  Kornhauser (1965)

Type of Worker	N	Instrument	Major Findings	Reference
Men Aged 21 or	701	Srole's Anomie Scale.	Anomia results when	Meier & Bell (1959).
Over Type of			individuals lack access to	
Worker not			means for the achievement	
Reported)		Tellines Taxon Otto Sect (3)	of life goals. Lack of	
		And the state of the state of the state of	opportunity to achieve life	
			goals follows mainly as a	
		The special control of the same that	result of the individual's	
		Assessment of the Section of the Sec	position in the social	
			structure as determined by	
			variables such as occupa-	
		to an interest to the second	tion, education, income,	
			etc. Factors such as these	
			are related to anomia.	
Blue Collar	206	Interviews.	Negative and technical	Meissner (1971)
			constraints and social in-	
			teraction on job and in	
			leisure activities.	
Undergraduate	40	Protestant Ethic Scale,	The high Protestant Ethic	Merrens & Garrett
Psychology Students	1 1 5 5 7 4		group, as determined by	(1975)
		and the second and the second	scores on the scale	•
		Mark the court of	administered, spent	
			significantly more time	
			working on a repetitive	
			task (writing X's on sheets	
			of paper) and produced	
			significantly more output	
			than did the low group. It	
			was concluded that the type	
			of work behavior studied is	
			a component of the Protes-	
	A-D-T-		tant Ethic personality	
			variable.	
		+	Scores on the Protestant	Mirels & Garrett
Male and Female	224	Protestant Ethic Scale		The state of the s
Undergraduate		Mosher Scales for Sex	Ethic Scale were positively	(1971)
Students		Guilt and Morality	related to the Mosher	
		Conscience, Hostile	Scales, unrelated to the	
		Guilt Scale: Strong	Hostile Guilt Scale. Also,	
		Vocational Interest	Protestant Ethic Scale	
		Blank (SVIB).	scores were positively	
		A LONG TO SERVICE OF THE SERVICE OF	correlated with SVIB scales	
			for occupations requiring a	
			concrete, pragmatic approach	
			to work and negatively	
			correlated with scales for	
			occupations requiring	
	The second second		emotional sensitivity of	
			theoretical and humanistic	
			interests and values.	
Office and	310	Inventory covering the	Important differences in	Pym (1963)
Factory Workers		cause-attitude-effect	aggression we're found be-	-7 (2202)
de corp morners				
		schema of occupational	tween the occupational	
		schema of occupational	tween the occupational	
		behavior; sixteen-	groups that could not be	
		behavior; sixteen- item-picture-	groups that could not be explained completely in	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in	
		behavior; sixteen- item-picture-	groups that could not be explained completely in terms of the differences in frustration derived from	
A.		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was	
A STATE OF THE STA	83 11	behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differ-	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of	
	2	behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identifi-	
		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group.	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job en-	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the loarning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution	Schwartz & Gruenfeld (1975)
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be chal-	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be chal-	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved,	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be un-	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore,	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore, changing the work structure	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore, changing the work structure does not alleviate the	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore, changing the work structure does not alleviate the problem, for once the new	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore, changing the work structure does not alleviate the problem, for once the new structure is in place, it	
Review Article		behavior; sixteen- item-picture- frustration study	groups that could not be explained completely in terms of the differences in frustration derived from work itself. It was suggested that the differences between office and factory workers and also between unskilled and skilled workers was due partly to the learning of acceptable aggressive behavior through identification with the work group. The position that job enlargement is the solution to the problem of worker alienation can be challenged by the point that all work can provide selfesteem, but once achieved, this self-esteem may be unstable. Therefore, changing the work structure does not alleviate the problem, for once the new	Schwartz & Gruenfeld (1975)

Type of Worker or Company	N	Instrument	Major Findings	Reference
Swedish Manual	558	Structured interview.	There is little evidence	Seeman (1967)
and Non-Manual			that alienation in work	
Workers			results in intergroup	
			hostility, anomia, political	
			withdrawal, status seeking,	
			or a sense of powerlessness.	
			However, those high in	
			alienation had significant-	
		Charles of the Control of the Contro	ly less interest in dis-	
			cussing their work with	
· · · · · · · · · · · · · · · · · · ·			others.	Seeman (1971)
Review of Studies			Four widely accepted	Seeman (19/1)
Conducted in the		The state of the s	propositions, concerning	
United States,			four types of alienation (self-estrangement, feelings	100000000000000000000000000000000000000
France, and			of powerlessness, social	
Sweden		A CONTRACTOR OF THE PARTY	isolation, and cultural	
		A Mark the second of the second	estrangement) are reviewed.	
	7 10 11 11 11	Lis in the same relation.	The evidence casts doubt on	
		The state of the s	the view that alienation is	
	4 6	Land Company of Second Services of		
	1111	Continues to the same of the continues o	a totalitarian, one-	
		ASSESSED A TEXT PROPERTY OF THE ASSESSED.	dimensional factor, and sees	
		THE REST CONTRACTOR COM	it related to many factors	
		CHARLES AND THE REST PARTY.	(e.g., the profound frustra-	
			tion of the worker, the	
			defeating effects of large-	
			scale organizations. etc.).	1 11000 1000
Oil Refinery		18 item, 5 point Likert		Shepard (1969, 1970
Workers	109	Scale from the Bray-	regard to the three samples	
Assembly-Line		field and Rothe Job	representing three levels	
Workers .	120	Satisfaction Index.	of functional specialization	
Maintenance		Three indexes in-	there was a negative correla	
Craftsmen	143	vestigating alienation	tion between degree of	
		from work (instrumental		
		work orientation, self- evaluative involvement	Furthermore, the three	
		in work, and commitment		
		to organizational	measured did not affect the	
		goals).	relationship between	
		goals, .	functional specialization	and the second program and the
		Pero almost a participation of	and job satisfaction.	1 - 2 / W 2 - 2 / L
Oil Refinery	305	Scales of Powerless-	Powerlessness, meaningless-	Shepard (1971, 1972
and Automobile		ness, Meaninglessness,	ness, and normlessness	
Manufacturer		Normlessness, Self-	contribute to variation in	
Employees		Evaluative Involve-	self-evaluation involvement	
zmp zoj ces		ment, and Instrumental	in work and instrumental	
		Work Orientation.	work orientation. Further-	
			moré, alienation exists to	
			the extent that there is a	
			discrepancy between the	
			criteria for status recog-	
			nition within a status	
			structure of which one is a	
			member and the criteria one	
			uses for self-evaluation.	
White and Blue	1533	Surveys, Interviews.	Results indicate that: a)	Sheppard & Herrick
Collar Union	371	land the state of	dissatisfaction with de-	(1972)
Members			humanizing aspects of	
			technology is widespread;	
			and b) among non-authori-	
			tarian workers, this dis-	
			satisfaction can lead to	
			socially and politically	
	1000		destructive attitudes and	
The state of the s	A STATE		behavior.	
Auto Workers	888	MacMillan Index	Auto workers revealed no	Siassi, Crocetti,
and Spouses		(Mental Health) .	more evidence of loneliness,	& Spiro (1974)
		Satisfaction Ques-	boredom, life dissatisfac-	
		tionnaire.	tion, work dissatisfaction	
			or depression than their	
			spouses. 95% of auto	
			workers satisfied.	
J. S. Naval	149	Protestant Ethic Scale.	The job scope (JS) - satis-	Stone (1975)
Enlisted Men			faction with the work itself	
			(SWI) relationship was	
			positive and significantly	
			different from zero for the	
			study's total sample and	
			each of the three Protestant	
The second second			Ethic (PE) subsamples.	
			Also, PE did not moderate	

Table 6 (Cont'd.)

Type of Worker or Company	N	Instrument	Major Findings	Reference
Telephone Company Craft Jobs	593	Job Descriptive Index, Hackman and Lawler 8 Job Factor Questionnaire.	Workers on jobs of larger scope did not experience greater dissatisfaction with work which did not support Hulin.and Blood (1968) alienation model.	Stone & Porter (1973
Industrial Workers in England	5274	153-item questionnaire investigating jcb specialization, work dissatisfaction, and work values.	Results were inconsistent and found a weak positive r between job specializa- tion and worker dissatis- faction regardless of alienation.	Taveggia & Headley (1975)
Female Telephone Operators	80	Questionnaires in- vestigating urban vs. rural background, Protestant Ethic, and higher order need strength. Job satis- faction was measured with the Minnesota Satisfaction Questionnaire,	High vs. low "higher order" need strength is the best way to measure individual differences as they are relevant to job design. The Protestant Ethic showed some usefulness as a moderator, but urban/rural background differences did not affect employee reactions to job characteristics.	Wanous (1973)
Production Workers	300	Not Reported.	Workers who produced above group standards (rate-busters) were rural, republican, sons of farmers or businessmen and looked to parents rather than peers for standards. Quota restricters were from large cities, democratic, working-class families and depended on peer group. They reject management standards.	
Glass Manufacturing Company Employees Covering Seven Occupational Groups	495	Survey of Work Values (SWV)	SMV scores discriminated meaningfully among occupational groups and correlated substantially with background variables associated with other measures of work values.	Wollack, Goodale, Wijting, & Smith (1971)

independent, confident, and flexible. They rejected stability, routine, and conventional standards. They had a strong tendency to seek freedom of movement and to persist on a task (Saleh & Grygier, 1969). Intrinsic job orientation has also been related to job satisfaction, job tenure, and job complexity (Saleh & Hyde, 1969a, 1969b; Saleh & Pasricha, 1970; Saleh & Singh, 1973).

In an attitude study of 136 IO and 136 EO employees, a positive relationship was found between intrinsic orientation and job complexity as reflected by salary level ( $\underline{r} = .37$ ). Intrinsic orientation was also positively related to education ( $\underline{r} = .40$ ), and more men were intrinsically oriented than women. It was also found that IO's had a higher level of job satisfaction than EO's (Saleh & Hyde, 1969a). In a study of sex differences in job orientation, it was found that controlling for education and job level, no sex differences appeared in job orientation. The higher the job level, the more intrinsically oriented the employee, regardless of sex (Saleh & Lalljee, 1969).

Intrinsic orientation has also been related to job tenure, job mobility, and father's occupation. Some of these relationships are moderated by salary level (Saleh & Hyde, 1969a, 1969b; Saleh & Pasricha, 1970, 1975; Saleh & Singh, 1973).

In laboratory studies of the relationship of this orientation to task performance, it was found that low anxious EO's performed better than high anxious EO's in all conditions. However, low anxious IO's performed better than high anxious IO's only in an experimental condition of working alone as compared to working while being observed (Saleh & Brown, 1972).

Pennings (1970) found in an interview study of 314 low white-collar workers in the Netherlands that workers in units with a high promotion rate had an intrinsic value system, whereas workers in units with low promotion rates had extrinsic values. These results indicate that intrinsic-extrinsic orientations may be a function of situational variables within the work unit. Low white-collar workers with very little hope of promotion may be compared to blue-collar workers in similar work situations.

Richman (1972) investigated intrinsic-extrinsic orientation as a moderator of job redesign decisions and preferences. He used a job preference inventory as a measure of the individual's intrinsic or extrinsic need orientation. The subject was presented two jobs and indicated the job he would want and the reason for it, or as an alternative, the job he would not want and the reason he would not choose that occupation. High agreement in coding the responses had been reported.

A case study involving job design decisions was also presented to these subjects. Seventeen possible solutions or actions were presented to the respondent who was required to rank order the solutions in terms of their effectiveness. The actions were included in terms of being directed to the intrinsic or extrinsic aspects of the job. It was assumed that this simulation corresponded to a real job redesign situation.

The main hypotheses of the study were not supported. Individual work orientation from the job preference inventory did not relate significantly to the proposed solution in the case study. In other words, those with the most intrinsic personal orientation did not choose a redesign solution which could be classified as an intrinsic solution, nor did those with the hygiene extrinsic orientation propose significantly more often the extrinsic job design problem solution. There was also no significant support for the hypothesis that self-esteem would moderate the relationship between need orientation and job redesign preferences.

Robey (1974) investigated the effect of value systems on job enrichment. This study was reported in Chapter VI of this report. In summary, Robey found that extrinsic subjects expressed higher satisfaction in the specialized repetitive computer treatment; intrinsic subjects derived higher satisfaction from the enlarged hand condition. The results must be interpreted with caution as the sample of extrinsic subjects was very small.

#### Job Involvement

Other investigators have investigated job involvement as a construct and as a moderator in the job satisfaction-performance relationship. Wood (1971), in a study of 41 female machine operators, found that job satisfaction and performance were not related for the sample as a whole. Dichotomizing the sample into high and low job involvement groups resulted in significant relationships. The low job involvement group was younger, lower in seniority, had more education, were somewhat less productive, and less satisfied than the high job involvement group. Ability, as measured by a shop arithmetic test, non-language mental ability test, closure flexibility test, and perceptual speed test, was differentially related to actual productivity with the two groups of high and low job involved workers. With the low job involved

workers, the arithmetic and mental tests were significantly related to actual productivity, and closure flexibility and perceptual speed were related to supervisors' ratings of performance. For the high job involved workers, none of the relationships between ability test scores and production were significant. It was concluded that high job involvement may have obscured the ability-performance relationships, while low involvement accentuated them.

In a later study by Wood (1974), it was found that workers least involved with their work exhibited much more similarity between their job attitudes and the organization's evaluation of their performance. With low job involved workers, high job satisfaction was related to high performance, low absenteeism, and high motivation. With high job involved workers, behavior and attitude showed few systematic relationships.

Job orientation has been related to overall job satisfaction. Dubin, Champoux, and Stampfl (1973) found, in a sample of blue-collar males ( $\underline{N}=430$ ) and female clericals ( $\underline{N}=580$ ), that job oriented workers had the highest overall job satisfaction and non-job oriented workers had the lowest. Satisfaction with the work itself had the strongest relationship to job involvement. In another study of the personality correlates of job involvement, it was found that job oriented males were higher on the decisiveness, initiative, supervisory ability scales of the Ghiselli Self Description Inventory. Non-job oriented males scored highest on the need for job security scale and scored lowest on decisiveness, need for occupational achievement, initiative, and need for self-actualization scales. Males in the

middle of the job involvement continuum (no preferences) had the highest need for self-actualization and occupational achievement. Female clerical workers differing in job involvement could not be distinguished on the basis of personality variables (Dubin & Champoux, 1973).

## Internal-External Control

Another related construct applied to work motivation and performance is the internal-external control of reinforcement which has been conceptualized by Rotter (1966) as a generalized expectancy of individuals within the framework of the social learning theory. Individuals differ in the degree to which they see reinforcement as due to their own efforts (internal control) or as due to outside factors, such as luck or the environment (external control). Evans (1971) related this internalexternal dimension to Herzberg's two-factor theory. Data on 28 college students did not support the hypotheses that internals would give more intrinsic responses in describing what contributed to feeling good or bad about the job; internals would give balanced responses to good and bad job sequence, and externals would give unbalanced responses. In a later study, Evans (1973) used the internal-external control dimension to moderate the relationship between overall job satisfaction and the discrepancy model of job satisfaction (should be-is now). The intrinsic-external control dimension acted as a moderator on the "should be" component of each job facet rather than on the "is now" component of each job facet.

Gemmill and Heisler (1972) investigated the relationship between internal-external control, job satisfaction, job strain,

and positional mobility in a sample of 90 managers. Managers with a belief in internal control reported lower job strain, higher job satisfaction, and more positional mobility than managers with a belief in external control.

### Distinctness of Motivational Constructs

In a study designed to explore the distinctness of three motivational constructs, job involvement, satisfaction of self-actualization and autonomy needs, and intrinsic motivation,

Lawler and Hall (1970) found that these were three separate factors that related to job design factors and job behavior differentially. All of the job design characteristics measured showed significant and stronger relationships to satisfaction than to involvement or intrinsic motivation. However, satisfaction was not related to either self-rated effort or performance. Intrinsic motivation was less strongly related to the job characteristics measured but was more strongly related to both effort and performance than was either satisfaction or involvement. The study involved 291 scientists in research and development. Most of the scientists held masters or bachelors degrees, and the results probably cannot be generalized to other work populations.

Past research efforts on these motivational constructs have been characterized by difficulty in the operational definition and measurement of constructs and variables. An example of this problem is the relationship between the various measures of intrinsic-extrinsic work orientation. Three common measures of intrinsic-extrinsic orientation are the Job Attitude Scale (Saleh, 1971b), the Survey of Work Values (Wollack, Goodale, Wijting, & Smith, 1971), and the Job Orientation Inventory (Blood, 1969,

1973). Although all of the above instruments purport to measure intrinsic and extrinsic orientation, each is based on a different conceptual and theoretical model. A recent study (Alexander, Balascoe, Barrett, O'Connor, & Forbes, 1975) indicated that these three measures were not conceptually equivalent. Convergent validity was not established for the three measures of intrinsic-extrinsic orientation, and it was found that perhaps a substantial portion of the variance across the three instruments could be attributable to the measuring instruments. These results point to serious problems in the current measurement of work orientation. Studies of job involvement are summarized in Table 7.

### Higher Order Need Strength

### Maslow's Theory

The most popular theory of motivation has been presented by Maslow (1943) which has been applied to industrial/organizational psychology. Maslow's theory has been categorized as one of those rate pronouncements which has taken on the character of "received doctrine" (Barrett, 1972). The theory has been misinterpreted in the past, and the basis of Maslow's conceptualization has not been captured in the scales which purport to measure the construct. For example, Maslow (1965) emphasizes the point that self-actualizing people in his studies have all been hard workers, dedicated and devoted people who tended to pour themselves into their duties or vocations with which they had identified. He stresses the point that mere desire for self-actualization without hard work is not possible. The usual questionnaire approaches are only capable of measuring expressed desire, not the richer connotations of the concept.

Table 7

Job Involvement - Intrinsic/Extrinsic Orientation

Type of Worker	Manage Maria			
or Company	N	Instrument	Major Findings	Reference
Manufacturing	Sample A. =	7 point rating scales	In neither sample were there	Aldag & Brief (1975a)
Company Employees	122	measuring presence of	significant differences	And the contract of the Co
Public Sector	Sample B =	core dimensions.	between younger and older	
Service Agency	99		employees in perceived	
Employees		Questionnaires in-	autonomy, skill, variety,	
		vestigating satis-	or feedback from the job.	and the state of the state of
		faction and higher	Both younger and older	
	The Control of the	order need strength.	workers were more satisfied	
			with higher levels of these	
	•		task dimensions. These	
	100		findings refute some stereo-	
			types that older employees	
			place more importance on	
	1		extrinsic job factors.	
	1		A CONTRACT OF THE PROPERTY OF	
			Older workers in Sample A	
			showed higher general satis-	
			faction and growth satis-	THE RESERVENCE OF REAL PROPERTY.
			faction than did younger	
			workers. Older workers	
			responded favorably to jobs	
			high on task identity and	
	1			
	1		younger workers to those	
			low on task identity.	
Male and Female	118	Wesman Personnel	Analysis indicated that dif-	
College Under-		Classification Test	ferent measures of intrinsic	
graduates		Orientation Inventory	and extrinsic orientation	Forbes (1975)
		Maudsley Personality	were neither operationally	
		Inventory	nor conceptually equivalent.	
		Rod and Frame Tost	Also, low relationships were	
		Attribute Preference	found to exist among dif-	
		Scale	ferent measures of prefer-	
		Survey of Work Values	ence for job structural	
		Biographical Informa-	attributes. It appears that	
		tion Blank	preferences for job	
		Job Orientation	structural attributes were	
		Inventory	not independent of abilities	
	Secretary and	Job Attitude Scale		Section and the Control of
			nor are they determined	
		The Work Itself/Work	largely by an intrinsic or	
		The Work Itself/Work Environment Preference	largely by an intrinsic or	
r militer (nep)		The Work Itself/Work Environment Preference Questionnaire	largely by an intrinsic or extrinsic orientation.	Charle social
Engineers	200	The Work Itself/Work Environment Preference Questionnaire Job Satisfaction	largely by an intrinsic or extrinsic orientation.  Results did not support the	Armstrong (1971)
Engineers Assemblers	200 153	The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job- factor importance was a	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational	Armatrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job- factor importance was a	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important	Armstrong (1971)
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated con-	Armstrong (1971)
Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.	yye taroyeg Sware og ede f wat their
		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature	Armstrong (1971)  Bieshevvel (1975)
Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical	espelarousi Tale projugat 1005: Les Ta
Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence	espelarousi Tale projugat 1005: Les Ta
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Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic	Bieshevvel (1975)
Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between workextrinsic and work-intrinsic factors is useful provided	Bieshevvel (1975)
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Assemblers		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of jobfactor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both.	Bieshevvel (1975)
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Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "motivators" and the latter as "hygiene."	Bieshevvel (1975)
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Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "myciene."  It is concluded from a review of research that many of the critics of Herzberg's theory disre-	Bieshevvel (1975)
Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "motivators" and the latter as "hygiene."  It is concluded from a review of research that many of the critics of Herzberg's theory disregarded the explanations	Bieshevvel (1975)
Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "motivators" and the latter as "hygiene."  It is concluded from a review of research that many of the critics of Herzberg's theory disregarded the explanations presented. There was	Bieshevvel (1975)
Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of job-factor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important.  A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "motivators" and the latter as "hygiene."  It is concluded from a review of research that many of the critics of Herzberg's theory disregarded the explanations	Bieshevvel (1975)
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Assemblers  Review		The Work Itself/Work Environment Preference Questionnaire Job Satisfaction Index, Job Factor Satisfaction Scale measuring 5 content and 8 context	largely by an intrinsic or extrinsic orientation.  Results did not support the content-context factor dichotomy. Ratings of jobfactor importance was a function of occupational level; engineers rated content factors as important and assemblers rated context factors as important. A review of the literature provides both theoretical and empirical evidence against the validity of the Herzberg two-factor theory. The distinction drawn by Herzberg between work-extrinsic and work-intrinsic factors is useful provided we accept that a satisfaction-dissatisfaction continuum applies to both. There is no usefulness in designating the former as "motivators" and the latter as "hygiene."  It is concluded from a review of research that many of the crivics of Herzberg's theory disregarded the explanations presented. There was evidence of ambiguity, of forced context, and of unjustified extrapolation	Bieshevvel (1975)

		Table 7 (Con	t'd)	
Type of Worker	N ·	Tnetminet	Major Pindings	P
College Students	323	Work Components Study	Major Findings Factor analysis of measures	Reference
College Students	323	Work Components Study	of work motivation based on	Borgatta (1967)
		Hadron College		
			Herzberg's theory identified	
			the following variables:	
			1) challenge of job, 2) tol-	
			erance for uncertainty, 3)	
			conservative security, 4)	
			competitiveness-desirability	
			5) tolerance for work	
			pressure, and 6) concern	
			for surroundings.	
New Industrial	1179	Work Components Study	Both the WCS and the WCS	Borgatta, Ford, &
Hires		(WCS)	Alternatives score appears	Bohrnstedt (1968,
Seniors in a	588	Work Components Study	to be reliable and valid	1973)
I chnical College	300	Alternatives Score	measures of work versus	Borgatta & Ford
Seniors in a	536	Arternacives beore	hygienic orientation.	(1970)
	230		nygienic offentation.	(1970)
State University				
Correctional	104	Questionnaire meas-	This study provided strong	Brief & Aldag (1975
Division		uring a) perceptions	support for the presence of	
Employees		of job core dimen-	positive associations be-	
		sions, b) internal	tween a worker's perceptions	
		work motivation, c)	of his job's character-	
		general job satis-	istics and his affective	
		faction, d) job in-	responses to that job.	
		volvement, e) higher	However, more research is	
		order need strength.	needed as to how higher	
		f) specific satis-	order need strength	
		factions.	moderates these relation-	* .
			ships.	
Sales Employees	540	Survey of Work Values	Satisfaction with the work	Cascio (1973)
sales Employees	540	Survey of Mork values	itself was not the most	Cascio (13/3/
		the state of the same and the	important determinant of	
			overall satisfaction for	
			those high in intrinsic	
			value orientation and low	
			in extrinsic value orienta-	
			tion. Satisfaction with	
			work environment factors was	
			the most important	
			determinant of overall sat-	
			isfaction for those high	
			in extrinsic value orienta-	
			tion and low in intrinsic	
			value orientation.	
Cross-Section of	692	· Interview	Extent to which intrinsic	Centers & Bugental
Working Population			or extrinsic job components	(1966)
or any repare			were valued was not related	
			to sex but was related to	
			occupational level (higher	
			occupational levels -	
			intrinsic: lower - extrinsic	.).
			Women placed a higher value	
			on good "co-workers." Men	
		many and the state of the state	placed a higher value on	
			opportunity to use their	
			talent and skill.	(1075-1)
aployees of a	178	25 Semantic	Individuals classified as	Champoux (1975a)
harmaceutical		Differential Scales	spilloverwork-oriented/	
irm			nonwork-oriented viewed	
			their work and nonwork	
	**		experiences in approximately	
			equal ways. Individuals	
			classified as compensatory	
		and the lead of th	work-oriented/nonwork-	
		the second second second		
,			oriented showed sharp con-	
			traststhose who were work-	
			oriented viewed their work	
			experiences as more posi-	
		A CONTRACT OF STREET	tive; those who were non-	
			work-oriented viewed their	
		The state of the s	work experiences as less	
			positive.	
Public School	271	Herzberg's Critical	Results confirmed motiva-	Clark (1970)
dministrators		Incident Technique	tion-hygiene theory. Per-	
		California Psycho-	sonality characteristics	
		logical Inventory	associated with growth,	
		(CPI)	ascendancy, and independent	
		(CPI)		
			thought were positively	
The state of the s			related to the degree of	
			motivator orientation.	
			motivator orientation. Hygiene orientation was	
		•	motivator orientation.	

Type of Worker or Company	N ·	Instrument	Major Findings	Reference
Review			Concludes that individuals	Cooper (1973)
			differ in their desire for	
			intrinsic interest in work	
			and the differences exert	
			moderating effects on the	
			relationship between four	
			task dimensions (physical	
			variety, skill variety, goal	
			structure, and transforma-	
			tions) and the dependent	
			variables of job behavior	
			(performance, satisfaction,	
			absenteeism, and turnover).	
Review			Concludes that men perform	Cooper & Foster
			optimally when they can con-	(1971)
			trol environmental contin-	
			gencies, responsibilities	
			are specified, and when they	
			are motivated. Motivation	
			must derive from the task	
			itself and the most	
			important dimensions of work	
			structure are role differ-	
			entiation, task dependence,	
	,		and goal dependence.	
White-Collar	442	5 Point Likert Scale	Results indicate that for	Dachler & Hulin
Workers		and Adjective Check	all environmental and job	(1969)
		List measuring satis-	characteristics a V-shaped	
		faction and importance		
		of 21 environmental	faction and importance was	
		and job character-	obtained providing that	
		istics.	both satisfaction and	•
			importance were assessed by	
			Likert Scales. No V-shaped	
			relationship was found when	
			satisfaction was measured	
			by adjective check lists.	
	1 000 00101	of the second second	It was concluded that the	
			results depend on the	
			measurement scale used and	
			therefore, cannot be inter-	
	The state of the s		preted as supporting the	
			two-factor theory of job	
			satisfaction.	
Summary of Six			Results of this group of	Deci (1971, 1972a,
Studies			studies conclude that	1972b, 1972c, 1973,
			extrinsic and intrinsic	1975)
			motivation should be viewed	1
			as nonadditive. Extrinsic	
			rewards decrease intrinsic	
	7. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		motivation though positive	
			feedback to males increases	
			intrinsic motivation. Re-	
			wards contingent on per-	
			formance and expected be-	
			fore behavior begins	
			decrease intrinsic motiva-	
			tion. This occurs because	
	100		rewards change the per-	
			ceived locus of control	
	100 100 100		and change feelings of	
			competence and self-	
			determination.	
Blue-Collar	427	Central Life Interest	Job-oriented males were	Dubin & Champoux
Telephone		Questionnaire	higher on decisiveness,	(1973)
Employees	1		initiative, and supervisory	
P101000	Will be the		ability scales; non-job-	
Female Clerical	141		oriented males were highest	
Telephone	141		on need for job security;	
	1 1/4/	Control of the Contro	no preference males were	
Employees		A ARCHARD HOLDER AND A STREET	highest on need for self-	
		Children W. Wallet		
		Carlot Section Colors	actualization and need for	
	( Page 1		occupational achievement.	
ACCRECATION OF THE PARTY OF THE		A CONTRACTOR OF THE PARTY OF TH	Female clerical workers	
		Marie Colores and Provident	from each other in terms of	

Type of Worker			Wadan Eindings	Deference
or Company	N 28	Instrument.	Major Findings An investigation of the	Reference Evans (1971)
Canadian College	28	Herzberg-type		Evans (19/1)
Students		questions as to what	impact of an external	
		contributed to feeling	(chance) vs. an internal	
		good or to feeling	(self-determination)	•
		bad about the job.	orientation upon responses	
			did not support the follow-	
			ing hypotheses: internals	
			will give more intrinsic	
			responses and give	
			balanced responses to good	
			and bad job sequences,	
			and externals will give	
			unbalanced responses.	
Review			The intrinsic nature of the	Fein (1973, 1974)
			job is secondary in	
			importance to many blue-	
			collar workers. Of primary	
			concern to the worker are	
		- All the country of	his pay, his job security,	
			and the rules of his work	
			place. A new approach to	The same of the sa
		Action to intoward	job design that balances	
		The second secon	intrinsic and extrinsic	
		and the same of th	motivational factors should	
			be adopted.	
Government	1935	146 Item Questionnaire	An investigation of the	Friedlander (1965b)
	1935			Filadiander (1903b)
Employees		investigating satis-	relationship between the	I almost the an investment of the
Videona reig			importance of 73 environ-	
1		with environmental	mental factors and satis-	
		factors and the	faction/dissatisfaction	
		importance of these	indicated a position cor-	
		factors.	relation between satis	
		1	faction and importance and	
			a negative correlation be-	
			tween dissatisfaction and	
		<u> </u>	importance.	/10/
U. S. Civil	1468	Questionnaire	White-collar workers con-	Friedlander (1965a)
Service Employees		measuring importance	sidered intrinsic factors	
		of various work	(e.g. achievement, chal-	
		factors.	lenge) most important,	
			while blue-collar workers	
			considered extrinsic	
			factors (comfort and secur-	
			The state of the s	
		J	ity) most important.	
White-Collar	1047	Questionnaire in-	In the white-collar sample,	Friedlander (1966)
Workers		vestigating satis-	low performers were moti-	
Blue-Collar	421	faction with various	vated primarily by the	
Workers		factors in the work	social environment of the	
mor vera		environment and the	job and there were few	
			significant relationships	
		relative importance		
A STATE OF THE PARTY OF THE PAR		of these environmental	between intrinsic motiva-	
1		factors.	tions and job performance.	
		CONTRACT SHIP SHIP	In the blue-collar sample,	
1		had a company of the state of	there were no significant	
			relationships between any	
			of the motivational	
	*		measures and job perform-	
			ance.	Gruenfeld &
Civil Service	96	Group Embedded Figures	For global perceivers	
Supervisors		Test	(field dependent), intrinsic	Weissenberg (1970)
		Wernimont Job Satis-	and extrinsic satisfactions	
		faction Questionnaire.	correlated with each other .	
			and with overall job satis-	
			faction. For analytical	
			perceivers (field in-	
			dependent), intrinsic and	
			extrinsic satisfactions	
			were independent and only	
			intrinsic satisfaction	
			correlated with overall job	

Type of Worker or Company	N_	Instrument	Major Findings	Reference
Review			Presentation of a motiva-	Herzberg (1964, 1966,
			tion-hygiene theory	1968, 1971)
			proposing that intrinsic or	
			content job features can	
			lead to heightened motiva-	
			tion and that extrinsic or	
			context job features have	
			the potential in their	
			negative aspects for	
			producing only lessened	
			motivation. Motivation-	
			hygiene theory suggests that jobs can be enriched	
			by manipulating motivating	
			factors (e.g. responsibil-	
			ity, achievement, recogni-	
			tion), which lead to job	
			satisfaction but not by	
			manipulating hygiene	
			factors which are related	
			to job dissatisfaction.	
Engineers and	200	Interview	Job-satisfied respondents	Herzberg, Mausner,
Accountants		Critical Incident	tended to describe factors	& Snyderman (1959)
		Technique	that were task oriented,	
			while job-dissatisfied	
			respondents reported	
Carlotte Michigan			factors involving job con-	
2			text or surroundings.	Vanlan Manala
Review			Review of studies involved	Kaplan, Tausky, &
			with motivation-hygiene	Bolaria (1969)
			theory indicates that the	
			majority of studies that	
			support the theory used a similar methodology to the	
			original Herzberg study	
			(17 out of 21 confirming	
			studies). Of the 18 dis-	
			confirming studies, 15 used	
			different methodological	
			approaches.	
Draftswomen and	76	Job Descriptive Index.	Performance was related to	Kesselman, Wood,
Toll Operators			satisfaction with the work	& Hagen (1974)
			itself, pay, and promotions	
			in the performance con-	
			tingent sample (pay was	
			based on piece rates). In	
		and an office of the second	the non-contingent sample	
			(pay was based on	
			seniority), performance	
			was related to satisfaction	
			with interpersonal factors,	
		ا خارجا ا	ray, and work.	
Scientists	291	Questionnaires	Results of a factor analysis	Lawler & Hall (1970)
	The state of the s		indicated that job-involve-	
			ment attitudes, higher	
			order need-satisfaction	
			attitudes, and intrinsic- motivation attitudes should	
			be thought of as separate	
			and distinct kinds of	
			attitudes toward a job.	
			These three types of atti-	
			tudes were found to be re-	
			lated differentially to job	
			design factors and to job	
			behavior.	
Nursing Personnel	137	20-Item Likert-type	The development of a job	Lodahl & Kejner (1965
		scale measuring job	·involvement scale in this	
		involvement.	study indicated that job	
		** ** ** ** ** ** ** ** ** ** ** ** **	involvement is a multi-	
		CHOICE OF THE STATE OF THE STAT	dimensional attitude that	
			can be scaled adequately,	
			but not with high	
			reliability; and that the	
			scale discriminates among	
			groups and has plausible	
			correlations with other	

Type of Worker or Company	N	Instrument	Major Findings	Reference	
Teachers	432	Parallel Versions of	The hypothesis that the	Miskel (1974)	
Educational	118	Borgatta, Ford, &	attitudes of educators		
Administrators		Bohrnstedt's Work	differ from the attitudes		
Business Managers	192	Components Study	of business managers toward		
nanagera		Questionnaire.	intrinsic-extrinsic rewards		
		accountaire.	and risk orientations was		
			supported. Business manag-		
			ers show attitudes with		
			high-risk propensity and		
			less concern for extrinsic		
			factors. At the opposite		
			pole, teachers show low-		
			risk propensity with a high		
			concern for extrinsic		
		Law ten a control of	factors.		
Normal Budandan		Officer Basing	Results indicate that the	Mitchell &	
Naval Aviation	51	Officer Attitude	Results indicate that the degree to which an individ-	Albright (1971)	
Officers		Questionnaire (OAQ)	ual is satisfied with his	Albright (19/1)	
			position and the Navy is		
			related more to intrinsic		
		date: of the kinds	than extrinsic satisfaction.		
			Also, the higher the amount		
			of intrinsic satisfaction,		
			the higher will be the		
			expectation of rémaining		
			in the Navy.	<del></del>	
Physicians	103	Scales measuring	A relationship between	Nathanson & Becker	
		intrinsic and extrinsic		(1973)	
		job values and job	ance was most likely to be		
		satisfaction.	found when: 1) the per-		
			formance in question		
			represented a valued skill		
			and 2) the individual had		
			internalized a well-		
		4.50	defined set of job values.		
Review			Review of research litera-	Notz (1975)	
			ture on intrinsic and		
			extrinsic motivation in-		
			dicates the following: 1)		
			Under certain conditions,		
			intrinsic and extrinsic		
	*		· motivation are non-additive		
			2) The interaction effect		
			of intrinsic and extrinsic		
			motivation may be		
			symmetrical. 3) Much con-		
			ceptual confusion still		
			surrounds intrinsic motiva-		
			tion and its relationship		
			to both higher order need		
		The state of the s	satisfaction and control.		
Paulau			Review of job satisfaction	Pallone, Hurley,	
Review			research indicates that	& Rickard (1971)	
			there is insufficient	- 11CMIL (19/1)	
			evidence to support the two-		
			factor theory and that salar		
			may be an important		
			component of satisfaction.  Low white-collar workers in	Pennings (1970)	
Low White-Collar	314	Interview		reminings (1970)	
Workers in an			units with a high promotion		
Electronic			rate had an intrinsic		
Manufacturing			value system whereas workers		
Organization	1 - 1 - 1		in units with low promotion		
			rates adhered more to		
			extrinsic values.		
Naval Personnel	629 .	Position Analysis	Results indicated that	Pritchard & Peters	
		Questionnaire (PAC)	satisfaction is related to	(1974)	
The state of the state of		Job Activity	actual job duties and that		
14.00		Preference	job duties are more highly		
	The state of	Questionnaire (JAPQ)	related to intrinsic		
	The state of the s	Minnesota Satis-	satisfaction than to		
	4				
		faction Questionnaire	extrinsic satisfaction.		

Type of Worker or Company	N ·	Instrument	Major Pindings	Pafavanas
College Students	6Q	Instrument 14-Item Questionnaire	Major Findings Subjects with extrinsic	Reference Robey (1974)
		assessing work values.	walue structures responded more favorably to a	
	No plat in		specialized computer task	250,000
	100000000000000000000000000000000000000	and the second of the second	than did intrinsic subjects.	
			On the other hand, subjects	
			with intrinsic work value	
			systems derived greater satisfaction from a manual	
		Supra di Carillania	analysis method than did	
			the extrinsic subjects. It	
			was concluded that job	
			satisfaction and performance were affected by the inter-	
			action of task design and	
	Lean alka	Hall to the second	work values.	
Managerial-	1311	Questionnaires in-	Considerable agreement was	Ronan (1970b)
Supervisory Employees	3653	vestigating the importance of various	found as to the most and least important character-	
Salaried	3033	job characteristics.	istics. Disagreements	
Employees			were mostly related to the	
Hourly Employees	6192		nature of the work by a	
		Mary and the second	particular employee group.	
	80.075	Professional Company	It appeared that the nature of the work done was an	
			important element of job	
			satisfaction.	* 100
Mining Company	1963	Objective Paper-and-	Results indicate that	Rosenfeld & Zdep
Employees		Pencil Instrument measuring intrinsic/	intrinsically oriented group	s(1971)
		extrinsic orientation	at the supervisory and salaried non-supervisory	
	1000000	CACTINGTE OFFICIACION	levels tended to be	
			younger, better educated	
			and have more dependents	
	ALEST MEDITAL		than their extrinsically	
College Students	192	Job Attitude Scale	oriented fellow employees. Intrinsically oriented	Saleh (1971a)
correge beddenes		Too meeting bears	individuals tended to per-	1277207
			ceive the task as more	
			difficult when observed	
	Control (Base)		than when alone, while	
			the opposite was true for extrinsically oriented	
			individuals. Thus, job	
			orientation can affect the	
		contract the test	reaction to the presence	
College Students	192	Job Attitude Scale	or absence of observers.  The findings point to the	Saleh (1971c)
orrego becaemes		1	importance of job orienta-	
			tion in relation to the	
		Minds the second	nature of supervision and	
		and collection and	to the nature of the task.  Both intrinsically and	
			extrinsically oriented in-	
*			dividuals were more satis-	
		27 - 27 - 27 - 27 - 27 - 27 - 27 - 27 -	fied with the simple task	
			in the supervised condi-	
		The state of the second of	tion than in the non-super- vised one. In the case of	
	THE REAL PROPERTY.		the difficult task, the	
			intrinsic subjects showed	
	Tenjaka.	The state of the s	a reverse tendency while	
		State Lauretten officer	the extrinsic subjects still showed more satis-	
			faction on the supervised	
			condition.	STATE OF THE PARTY
ocial Service	136	Job Attitude Scale	The results indicated that	Saleh & Grygier
gency Employees	Targue 1	Likes and Interests	concern with intrinsic	(1969)
		Test	factors signifies approach tendencies, while concern	
			with extrinsic factors	
			points to avoidance	
			tendencies.	Calab & Duda (1969 )
Not Reported	408	Mail-Back Attitude	Greater general satisfaction was expressed by those whose	salen & Hyde (1969a)
		Survey	orientation was toward	
			intrinsic job features.	
			Also, greater intrinsic	
			orientation was found among	
			men, plus a positive rela- tionship with job	
			eromanth with lon.	
			complexity and employee	

Type of Worker or Company	N	Instrument	Major Findings	Reference
College Students	. 84	Job Attitude Scale	The college population	Saleh & Lalljee (1969
Public School	101	Company of the Asset Section	showed no sex differences	merket in the
Teachers	400	to the April Street St.	in job orientation, nor did	
Employees of a Service-Oriented	402	meta sometic second that	the working population with job level controlled. In	
Organization			the third study with the	
organizacion			service organization	
	Share a		employees, there were no	
		read and one of the state of	sex differences with age;	
		Albert was public titled to	job level, and education	
	There are the	and the shaded all the shade	controlled. When these	
			variables are not controlled	
		Protein Legins Stock and	a significant difference	
	THE PERM		was found between clerks	yearships late to he
Pre-Retirees	85	Retirement Attitude	and supervisors. When subgroups were differ-	Saleh & Otis (1963)
rre-ketirees		Scale	entiated as job oriented	1
			and context oriented, the	
			first group was found to be	
			significantly less	
			satisfied with the coming	
			retirement than the second	
		The second second second	group. Thus, it seems that	and the second
		or souther the service of the	job oriented individuals	GEL STREET
			received satisfaction from	Fig. 5 de la consta
		THE STATE OF THE S	their jobs while the con-	The second second
White-Collar	3630	Ougationnaina	With age, sex, education	Saleh & Pasricha
Workers	3628	Questionnaire Investigating	and salary level con-	(1970)
OT VGT 3	1 40,000	Intrinsic/Extrinsic	trolled; it was found that	
		Orientation	those new on the job were	
	1 WA TH	The second second second second	more intrinsically oriented	
	(0.5)	And the Control of the Control	than those who had been on	
	3 1 1 1 1 1 1 1		their jobs for a longer	
		<del> </del>	period of time.	
White-Collar	4379	Survey	In a high-salaried group	Saleh & Pasricha
Employees			(over \$10,000), job change	(1975)
			(defined as number of jobs	
	artis.		held) was positively re- lated to intrinsic orienta-	
			tion. This was not true	
			in a low-salaried group	
			(under \$10,000).	
White-Collar	3000	Rankings of Six	In a low-salaried group,	Saleh & Singh
Employees		Intrinsic and Six	there was a positive rela-	(1973)
		Extrinsic Factors	tionship between father's	
			occupation (going from un-	
			skilled to technical to	
			professional occupations), community size, and job	
			orientation. No differences	
			in job orientation were	
			found in the high-salaried	
			group as a function of	
			either father's occupation	
	- / /		or community size.	
Middle Managers	149	20-Item Likert Scales	A significant linear rela-	Schwyhart & Smith
		measuring company	tionship between job in-	(1972)
		satisfaction and job	volvement and company	
		involvement.	satisfaction was found in-	
			dicating that the importance of the job to a	•
all shows and			worker's self-image is	
SHIP IN THE LOCKET	177		associated with his satis-	
			faction with the company.	
Manufacturing	2628	Questionnaires in-	Job involvement was signifi-	Siegel & Ruh (1973)
Employees		vestigating job involve		
		ment and participation		•
		in decision-making.	participation in decision-	
		Colombia (No. 1)	making. The correlation	* * * * * * * * * * * * * * * * * * *
			between participation in	
		1000	decision-making and job	
			involvement was significant-	
			ly greater for urban	
			individuals and those with	
			more education. These	
			results are interpreted as supporting a "complex man"	
			theoretical position in	
			regard to the interaction	
			between the individual and	
			between the individual and	

Type of Worker				
	N	Tostminest	Madau B/ 3/	
Or Company .   White- and Blue-	556	Job Descriptive Index	The findings indicated that	Reference Stone & Porter (1975)
Collar Telephone	330	Job Characteristics	the job an individual holds	
Employees		measure developed by	is associated not only with	
		Hackman & Lawler	attitudes about the work	
		(1971)	itself but also relates to	Same of the same o
		Roll of the balls on the	other attitudes (e.g.	
		The first and person with the second	satisfaction with pay).	
		CAR OF SHEET PROPERTY COME.	Fifty-three percent of the	
		THE RESERVE THE PARTY OF THE PA	variability in individuals'	
1		the transfer of the second	attitudes was explainable	
			on the basis of their group	
-			membership.	
Industrial Workers	489	Questionnaire in-	Persons ego-involved in	Vroom (1962)
in an Oil Refinery		vestigating ego-	their jobs are rated higher	
		involvement, job	in job performance than	
Electronics	399	satisfaction, satis-	those not so ego-involved.	
Manufacturing		faction with self,	There is also a tendency for	
Company		work-related tension,	the relationship between	
Employees		autonomy, and oppor-	ego-involvement and per-	
		tunity for self-	formance to be greater for	
		expression in the job.	persons high in autonomy.	
Key-Punch	52	Job Motivation Index	It was found that increasing	Wasson (1971)
Operators		Job Reaction Survey	seniority was associated	
Tellers	59	Otis Gamma Test of	with greater perception of	
Accounting	54	Mental Ability	motivators on the job,	
Officers			while high intelligence was	
	•		associated with low per-	
			ception of motivators.	
			Also, amount of motivation	
			deprivation varied as job	
			complexity varied while	
			there was no variation in	
			hygiene deprivation from	
			one job level to another.	Walanakana
Civil Service	96	Wernimont Job	It was found that motivator but not hygiene satisfaction	Weissenberg &
Supervisors		Satisfaction Scale	variables correlated with	Gruentela (1968)
		Job Involvement	job involvement. Total	
1	**	Measure (developed	motivator satisfaction	
		by Lodahl & Kejner).	scores accounted for more	
			variance in overall job	
			satisfaction than did	
	1.3			
	776	Panking of Joh Factors	hygiene variables.	Wernimont Toyen 6
	775	Ranking of Job Factors	hygiene variables. Factors such as personal	Wernimont, Toven, & Kapell (1970)
	775	Ranking of Job Factors	hygiene variables. Factors such as personal accomplishment, praise for	Wernimont, Toven, & Kapell (1970)
	775	Ranking of Job Factors	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting	
	775	Ranking of Job Factors	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were	
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact	
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.	
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.  Factors such as having	
	775	Ranking of Job Factors	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.  Factors such as having responsibility, knowing what is expected of one, and	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.  Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those	Kapell (1970)
	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.  Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact	Kapell (1970)
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	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall	Kapell (1970)
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	775	Ranking of Job Factors	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs.	Kapell (1970)
Technicians			hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.	Kapell (1970)
Technicians	775	Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring	Wollack, Goodale,
Five Occupational Groups Ranging			hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was	Wollack, Goodale,
Five Occupational Groups Ranging from Unskilled		Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction.  Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs.  extrinsic.  A series of scales measuring attitudes toward work was developed covering both	Wollack, Goodale,
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work,	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activity preference) and extrinsic	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit preference) and extrinsic (attitude toward earnings,	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activity preference) and extrinsic (attitude toward earnings, social status of job)	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit preference) and extrinsic (attitude toward earnings, social status of job) aspects of work. It was	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables.  Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit preference) and extrinsic (attitude toward earnings, social status of job) aspects of work. It was found that SWV scores dis-	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit preference) and extrinsic (attitude toward earnings, social status of job) aspects of work. It was found that SWV scores discriminated among occupation—	Wollack, Goodale, Wijting, & Smith (197
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activity preference) and extrinsic (attitude toward earnings, social status of job) aspects of work. It was found that SWV scores discriminated among occupational groups and correlated	Wollack, Goodale, Wijting, & Smith (197)
Five Occupational Groups Ranging from Unskilled through Profession-		Survey of Work Values	hygiene variables. Factors such as personal accomplishment, praise for good work, and getting along with co-workers were seen as having more impact on personal satisfaction. Factors such as having responsibility, knowing what is expected of one, and having a capable supervisor were seen as having more impact on motivation. It is concluded that those factors having more impact on motivation than on satisfaction do not fall into a neat classification system of intrinsic vs. extrinsic.  A series of scales measuring attitudes toward work was developed covering both intrinsic (pride in work, job involvement, and activit preference) and extrinsic (attitude toward earnings, social status of job) aspects of work. It was found that SWV scores discriminated among occupation—	Wollack, Goodale, Wijting, & Smith (197)

Type of Worker or Corpany	N	Instrument	Major Findings	Reference
Female Machine Operator	41	Seven Item 5-Point Likert Scale measuring job involvement.	The low job involvement group was younger, lower in seniority, had more education, and was less productive than the high involvement group. It was concluded that workers low in involvement are more satisfied extrinsically as productivity increased, while those high in involvement are more dissatisfied as production increases.	Wood (1971)
Skilled and Semi- skilled Papermakers	290	31-Item Questionnaire Investigating Job Involvement and Satisfaction/ Dissatisfaction.	An examination of correlations between worker attitudes and job motivation, performance, and absenteeism showed that significant relationships occur more frequently for those employees least job involved. Also, there were twice as many associations for skilled as for semi-skilled employees.	Wood (1974)

Wahba and Bridweil (1973) reviewed the research literature testing three propositions of Maslow's Need Hierarchy theory.

These propositions are that needs are arranged or classified into five categories. Second, needs follow a deprivation/domination pattern in that the most deficient need will dominate behavior.

Third, needs follow a gratification/activation pattern in that satisfaction of a need submerges it and activates the next higher need in the hierarchy. Wahba and Bridweil concluded that factor analytic studies have not yielded five independent needs. There was some support found for higher and lower needs. It is also reported that self-actualization may not represent a need, but simply a socially desirable response set emerging from cultural values.

In testing the deprivation/domination aspect of the theory, research studies have shown a U-shaped relationship between satisfaction and importance—the higher the satisfaction or dissatisfaction, the higher the ranked importance. Finally, longitudinal cross—lagged correlational analysis have not supported the gratification/activation portion of the theory.

Maslow's theory of personality was the basis for an extensive cross-cultural study conducted by Aronoff (1967, 1970). The investigation began as a field study of an island in the British West Indies. On the island, the investigator found two distinct groups of workers from the same village. These were the cane cutters and the fishermen; virtually all were descendants of Negro slaves. Nevertheless, the fishermen had a subculture and economic existence that were strikingly different from the cane cutters. The fishermen were, in effect, independent businessmen living

more by their own personal effort, while the cane cutters were much more dependent on the work from the sugar plantation. More-over, the cane cutters had suffered a significantly greater loss of parents and siblings in their first twelve years of life than the fishermen had. Maslow's theory would suggest that those who have been deprived of safety gratification early in life will fixate at that level. The results confirmed the hypothesis. The cane cutters received higher scores derived from interview analysis on the physiological and safety levels. In contrast, the fishermen had low scores on these two need levels. But on the levels of affection and esteem needs, the reverse was found, with the fishermen scoring very high in these needs and the cane cutters scoring relatively low.

This study was conducted in the early sixties, and while interesting, does not give any indication of a cause and effect relationship. Fortunately, Aronoff (1970) was able to study the situation over a period of time, and in effect, was able to report upon a natural experiment.

In 1962, the cutters were under the supervision of a head cutter and were organized into gangs of about eleven men. The whole work effort was organized by the head cutter, and the very authoritarian nature of the position allowed him to take advantage of the men in terms of both the amount of work and payment for services. The pay was based upon the productivity of the whole gang, so the slowest worker was paid the same as the best.

The 1970 cane cutters were essentially a different work force. The needs of the new group of cane cutters did not focus upon the physiological and safety needs, but upon the affiliative

and self-esteem needs. As was predicted by Maslow's theory, this new group of cane cutters had enjoyed a much more secure childhood during their first twelve years of life as compared with the older group of cutters.

Aronoff and Messe (1971) showed that the results obtained in the West Indies could be generalized for the United States. Screening 25 subjects with a combination of high safety needs and low esteem, and 25 with high esteem and low safety needs from 200 students, homogeneous five-man groups were formed. A standardized set of tasks was given to each group and the members' task-oriented behaviors were coded. As predicted, those groups made up of esteem-oriented persons were characterized by a desire to demonstrate competence both to themselves and to others, resulting in leadership functions being widely shared among members of the group. The safety-oriented groups had members who were reluctant to organize task activities because of their dependency and, as a result, leadership functions were concentrated in a few group members. Aronoff and Messe (1971) demonstrated that the prevailing needs of the homogeneous group does influence the social structure of the group. It is important to note that this experimental study grew out of the previous field investigations by Aronoff (1967, 1970). What was first found in a natural setting in groups with differences in background was subsequently reproduced in the laboratory and tested in a totally different culture. This lends more validity to the concepts and the importance of the needs being tested since results were replicated in two different cultures and in two different ways. These results stand in contrast to other research in organizations in

the United States which have failed to substantiate Maslow's theory.

### Industrial Research on the Theory

Carlson (1970) tested a hypothesis that if an individual rates highly or values a specific job characteristic, this provides a description of his underlying needs. A sample of 213 assemblers rated the importance of 196 job characteristics on seven-point scales. A factor analytic procedure yielded 14 needs. Three higher order needs were identified as general need for support (dependence on physical and social environment), competence (mastery of job and environment), and advantage in environmental needs. These needs and many lower level needs demonstrated generality over individual preferences.

Some investigators have failed to confirm the higher order need satisfaction theory of job design. Edgecomb (1966) investigated the effect of task attributes and supervision on need satisfaction. Using a sample of 500 female nonsupervisory employees, he measured five task attributes of technological autonomy: job repetitiveness, social isolation, job sophistication, and task interdependence. He found that task attributes had no effect on perceived need levels. However, employees who were satisfied with their supervisors reported less needs than those who were dissatisfied. A positive relationship was found between job satisfaction and need reduction.

Beer (1968) compared the need satisfaction of 44 clericals in complex jobs and 85 clericals in routine jobs in an insurance company. He found no substantial difference in need satisfaction between clericals in routine or complex jobs and no difference

in motivation between the two groups. He concluded that jobs which appear to management as being higher in responsibility or complexity do not always produce increased satisfaction of higher order needs.

Slocum, Chase, and Kuhn (1970), in a study of 104 high-skilled and 77 low-skilled operators in a steel mill did not find statistically significant differences in need satisfaction scores between high-skilled and low-skilled operators. The largest need deficiencies appeared in the security and self-actualization need categories. High-skilled employees' need satisfaction affected productivity, whereas in the low-skilled workers, need satisfaction was not related to productivity. The authors concluded that low-skilled operators are not concerned with self-actualization and/or acting independently in their work environment. Motivation programs that are designed to remedy this deficiency would, therefore, have a negative affect on job productivity.

Lawler and Suttle (1972), in a longitudinal study of 187 managers, tested the validity of the need hierarchy concept. The data offered little support for the theoretical position that human needs are arranged in a multi-level fashion. The authors suggested that needs may be viewed as existing on two levels, with the basic biological needs on the bottom level and all other needs on the top level.

Wild and Dawson (1972), in a study of 2,543 female electronic workers, found that the self-actualization factor was most related to overall satisfaction and that with increasing length of service the correlation between self-actualization and satis-

faction decreased. These results suggested the inadequacies of a general or global theory of job satisfaction or job design. The characteristics of workers and the possible need for regular re-employment of labor is needed to maintain job satisfaction of long-term employees.

Neeley (1973) concluded that studies investigating the influence of need fulfillment of job satisfaction and performance are less likely to increase our understanding than studies which examine the simultaneous effects of personality and psychological needs and situational variables on job satisfaction and performance.

Wanous (1973, 1974) studies these three approaches to the measurement of individual differences (urban vs. rural, agreement with the Protestant Ethic, and higher order need satisfaction) in relation to employee reactions to job characteristics. The sample involved 80 newly hired female telephone operators. Wanous concluded that the need strength moderator variable worked best, followed by the Protestant Ethic, and finally was the urban/rural dimension which did not moderate the relationships. It is interesting to note that none of the three variables moderated the relationship between job description and job behavior.

Recently, Brief and Aldag (1975) have attempted to replicate Wanous' research using as a sample 104 employees of a correction division whose goal was rehabilitation of inmates. Brief and Aldag found that the moderating effect of higher order need strength was relatively small. Only four of 37 correlations were significantly different from each other in differentiating those having high versus low order need strength. As in the

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previous Hackman and Lawler (1971) study, the definition of higher and lower need strength employees corresponded to the top and bottom third of the need strength distribution.

In summary, empirical tests of Maslow's need hierarchy theory have not been particularly promising. A number of the studies have used the Porter Need Scale as an operational measure of Maslow's categories. There is a general tendency for all the items of this scale to correlate with each other.

In addition to measurement problems, the construct of higher order need strength implies an internalized state of the individual that may be somewhat more removed from behavioral overt tendencies than other attributes.

# Industrial Applications of Theory (Hackman, Lawler, Oldham)

Applications of Maslow's theory to industrial settings have also yielded conflicting outcomes. Herzberg's conceptualization rests to a large degree upon the assumptions of Maslow's theory, as does the more recent conceptualization of Hackman and Lawler (1971), Hackman and Oldham (1974a, 1974b, 1975), and Hackman, Oldham, Janson, and Purdy (1974, 1975).

Hackman and Lawler (1971), in their expectancy theory approach to job design and enrichment, concluded that only workers with strong higher order needs would respond favorably to jobs which have been enriched on four core dimensions: variety, autonomy, task identity, and feedback. In a study of 207 telephone company employees who worked on 13 different jobs, it was found that when jobs were high on the four core dimensions, employees who desired higher order need satisfaction tended to have higher motivation, higher satisfaction, be absent less frequently,

and be rated by their supervisors as doing high quality work.

These relationships were not found for workers with lower level need structures.

The higher order need strength approach has been integrated with job enrichment concepts by the recent work of Hackman and Oldham (1974a, 1974b, 1975) and Hackman, Oldham, Janson, and Purdy (1974, 1975).

Employee growth need strength is viewed as the most important moderator in the relationship of core job dimensions, the motivating potential of jobs, and work outcomes.

They have attempted to test the various features of the theory by administration of the job diagnostic survey to large groups of employees in various organizations and correlating this with supervisors' ratings of performance and a measurement of absenteeism from company records.

One test was the correlation of job dimensions and psychological states with work outcomes. If the theory is correct, then psychological states should correlate higher with the work outcomes than the job characteristics which are conceptualized as preceding the psychological states. Psychological states did correlate higher with the outcome measures of internal motivation, general satisfaction, and growth satisfaction than did the various job characteristics. Analyses were not made for the significance of the difference between the correlations, so no definitive conclusions can be reached. In addition, median correlations were reported for an N size of 658 from seven organizations. This makes definitive inferences difficult to make. One wonders if this represents a response-response tech-

nology in that the items of expressed meaningfulness may be measuring the same thing as internal motivation. The authors presented some evidence to indicate that these are really separate dimensions of the theory. In terms of absenteeism and rated work effectiveness, the only two significant correlations for the psychological states were the relationship with experienced meaningfulness and experienced responsibility.

All of the job characteristics (task identiy, task significance, autonomy, feedback, and the total motivating potential score) were significantly related to supervisors' estimates of work effectiveness. Most of the job characteristics were in the correct direction when predicting absenteeism, with the motivating potential score having the highest relationship. Hackman and Oldham (1974a, 1975) do acknowledge the fact that because they use the same questionnaires to measure all the dimensions of their theory, there could have been method variance. This could account for the fact that the relationships with the outcome measures with absenteeism and work effectiveness were lower than they had anticipated.

Oldham, Hackman, and Pearce (1975) have specifically listed the conditions in which the concept of employee growth need strength moderates the job design satisfaction relationship. The test of the moderating influence of growth need strength was obtained by finding those individuals low and high in growth need strength and then correlating the motivating potential socre with the outcome measures of performance, salary corrected for tenure, and internal motivation. The only significant dif-

where sorting or endpains a company to the property of the desired

ference between these two groups was found for salary corrected for tenure.

In examining the relationship between motivating potential scores and the outcome measures of performance (salary corrected for tenure and internal motivation as moderated by satisfaction with various contextual factors), three out of fourteen correlations were significantly different from the high and low splits in the expected direction. This provides some weak support for the conceptualization.

It was also predicted that those employees who desire growth satisfaction at work and were satisfied with their work context would respond more positively to jobs with a high motivating potential score than employees with weak growth needs who were dissatisfied with their work context. These groups were formed and the motivating potential scores were correlated with the outcome measures. The results were positive, supporting the predictions. Job Enrichment Failures

In the last two years, as previously noted, job enrichment projects that have failed have finally been reported in the research literature. The failures are explained on the basis of problems in implementing job enrichment projects rather than weaknesses in the theoretical assumptions underlying the higher order need strength conceptualization.

Lawler, Hackman, and Kaufman (1973) report a redesign project involving telephone operators. The project involved job changes designed to increase the variety and autonomy job core dimensions. The results of the changes indicated no change in work motivation, job involvement, or growth need satisfaction.

In fact, older employees were dissatisfied with interpersonal relations after the change, and supervisors reported less job security. The hypothesis that higher order need strength was a moderator variable in job design changes was tested by comparing the amount of change for high need strength operators and low need strength operators. The amount of change did not differ for the two groups. This was explained by the researchers on the basis that there was a restriction in range, as there was little variation in need strength among the operators. The authors conclude:

The responsiveness of the measures of the core dimensions to actual job changes provides some evidence of their validity and potential usefulness. Despite the fact that the job was significantly improved on two of the four core dimensions, neither satisfaction nor motivation improved. One explanation for that is that even after the change, the job remained very low on both variety and autonomy. The Hackman-Lawler theory postulates that a job must be made high on all four dimensions for increases in motivation and satisfaction to be realized. Because the changes made in the directory assistance job did not reach this criterion, the data reported here are consistent with the theory. However, it does not provide a decisive test of it. What is needed are studies in which more dramatic changes in job design are made. If changes were made which yielded jobs high on all four core dimensions and increases in satisfaction and motivation did not materialize, then the validity of the theory would be in serious doubt. (p. 60).

Another failure in a job enrichment project in the stock transfer department of a large bank involved a change to semi-autonomous work modules and groups intended to function as "miniature stock transfer departments." The results of the project indicated that jobs tended to get worse rather than better after the change to work modules. The failure is explained on the basis of problems in implementing job enrichment. It was reported that the change to semi-autonomous work groups did not change the jobs

on at least four of the job core dimensions that contribute to the motivating potential score. The jobs did not change in skill variety, task identity, task significance, or autonomy. The authors conclude that the work redesign project affected many aspects of the organization but not the work itself (Frank & Hackman, 1975).

Parke and Tausky (1975), in an article entitled "The Mythology of Job Enrichment: Self-Actualization Revisited," conclude that the focus of job enrichment should be shifted from the assumed inner need for people to be self-actualizing to the consequences of work behavior in terms of accountability for performance and material rewards for output that meet or exceed clearcut standards. The authors state, "To build enrichment programs on the assumed inner need to accept and master challenging tasks can only result in essentially utopian exercises," (p. 21).

A summary of the research on need satisfaction is included in Table 8.

### Conclusions

These four conceptual approaches represent a recognition of the role of group and individual difference variables in job design and stand in opposition to earlier approaches which implicitly assumed the "one best method," "the typical worker," or a generalized motivational state present in all workers seeking intrinsic reward.

However, each of these four approaches, by focusing on one or a limited number of variables, may not be broad enough to encompass the complexities of the work environment. The variables have not been clearly defined or conceptualized and the research

Higher Order Need Strength as Related to Job Design

Type of Worker or Company	N	Instrument	Major Findings	Reference
Menufacturing Company Employees Public Sector Service Agency Employees	Sample A= 122 Sample B= 99	7-point rating scales measuring presence of core dimensions (variety, autonomy, task identity, and feedback) Questionnaires investigating general satisfaction, growth satisfaction, and higher order need strength.	Older workers in Sample A showed higher general satisfaction and growth satisfaction than did younger workers. There was no significant difference between younger and older workers in perceived autonomy, skill variety, or feedback from the job. Also older workers responded favorably to jobs high on task identity and younger workers to those low on task identity.	iena – Apoliat Zhadi estalia Mar ko asomija
Cane Cutters Fishermen		Interviews	Canc cutters who suffered loss of parents in child-hood higher physiological and safety needs. Fishermen were high on affection and esteem. 1970 cane cutters differed.	Aronoff (1967, 1970)
College Students High Safety-Low Esteem Low Safety-High	25	Task Performance	In high esteem groups, leadership function shared. In low esteem groups, leadership concentrated.	Aronoff & Hesse (1971)
Esteem Female Clerical Employees	129 1	Preference Inventory (requiring five needs on Maslow's hierarchy) Job Inventory (Mea- suring opportunity for need satisfaction on Maslow's five dimen- sions). Self-Descrip- tion Inventory.	There was no substantial differences in need patterns between clerical employees in routine jobs and those in more complex clerical jobs.	
Correctional Division Employees	104	Questionnaire measuring (a) perceptions of job core dimensions, (b) internal work motiva- tion, (c) general job satisfaction, (d) job involvement, (e) higher order need strength, (f) specific satisfac- tions.	has on the job characteris- ticsemployee reaction relationship is very small. Only 4 of 36 correlations	
Precision Assemblymen in an Electronics Firm	213	Questionnaire investigating 196 different job characteristics.	Three higher order dimensions identified as the general need for support (dependence on physical and social environment), advantage in environmental returns, and competence (mastery of job and environment) showed a great deal orgenerality over individual preferences.	
Retail Managers	(540) i san	Triple Audit Opinion Survey (TAOS)	Identified 12 different need types and concluded that need type has a moderating effect on specific satis- faction components in regar- to overall job satisfaction	(1972) 1873
Blue Collar Employees Female Clerical Employees	141	Central Life Interest Questionnaire Chiaelli's Self- Description Inventory	Job-oriented males were hig on decisiveness, initiative and supervisory ability scales, and low on the need for job security scale. Non-job-oriented males scored highest on need for job security scale and lowest on decisiveness, nee for occupational achievemen initiative, and need for self-actualization. No-preference male workers had highest scores for need for self-actualization and occupational achievement, and low scores on supervisory ability. Female clerical workers could not be differentiated	

Type of Worker or Company		N .	Instrument	Major Findings	Reference
Pemale Pharmaceutical Employees	500	TOTAL POLICE OF THE PROPERTY O	Questionnaires investigating task attri- butes, satisfaction with supervisor, and psychological needs.	Reported task attributes (technological autonomy, job repetitiveness, social isolation, job sophistication, and task interdependence) has no significant impact on any of the perceived need levels (self-actualization, affiliation, financial and job security). Also those satisfied with supervision reported less needs than those dissatisfied with supervision.	Edgecomb (1966)
White Collar Workers Blue Collar Workers	1047		Questionnaire investigating the relative importance of various factors in the work environment (e.g., opportunity for freedom on the job).	In the white-collar sample, low performers were motivated by the social environment of the job.  In the blue-collar sample, no significant relationships were found between any of the motivational measures and job performance.  Also, with advancing age and tenure, work became more meaningful for high performers but less meaningful for low performers.	
College students Employed College Graduates	100		105-item questionnaire investigating the need strength of students and the need satisfac- tions of employed graduates.	Factor matching of the re- sponses of students and grad- uates indicated the following dimensions to be of impor- tance: need to be creative, need to have authority, need for maintenance of moral values, need for advancement, need for mutual respect, and need for good working condi- tions.	
Telephone Company Employees	270		the presence of the fol- lowing job dimensions: variety, autonomy, task identity, feedback, fealing with others, and friendship with others; a questionnaire reflecting desire for	When jobs are high on the four core dimensions (variety autonomy, task identity, and feedback), employees who are desirous of higher order need satisfaction tend to have high motivation, high satisfaction in the job, be absent from work infrequently and be rated by supervisors as doing high quality work.	(1971) 
Blue Collar, White Collar, and Pro- fessional Employees in Seven Organiza- tions.	658		A STATE OF THE PARTY OF THE PAR	A model is proposed that spe- cifies conditions under which individuals will become in- ternally motivated to perform effectively on their jobs. Application of the model to employees on 62 different jobs supports its validity.	Hackman, Oldham, Janson
Theoretical			and a series of property the period of the	A three-level developmental hierarchy of motivation is proposed. The two lowest levels are the basic physiological drive system and the emotional drive system. The highest level is an intellectual drive system related to self-actualization and desire for self-expression. The highest level comes into play as a progressive function of tension reduction at lower levels.	Hackman, R.C. (1969)
Male and Pemale Teachers	203	92 (a) 02 (a) 02 (a) 03 (a)	Edwards Personal Preference Schedule Questionnaire	Satisfaction with an occupa- tion is a function of the discrepancy between personal needs and perceived potential of the occupation for satis- fying needs. Achievement need discrepan- cies were consistently re- lated to occupational satis- faction; thus, occupational satisfaction is a function of the degree to which needs are satisfied in the occupa- tion.	Kuhlen (1963)  **EL
Steel Workers	164		tion Questionnaire	The satisfaction of security and social needs is more closely associated with job performance than the satisfaction of job autonomy and self-actualization.	Ruhn, Slooum, & Chase (1971)

Type of Worker or Company	N	Instrument	Major Findings	Reference
Engineers	175	Orientation Inventory (ORI) Satisfaction Question- naire Peer ratings of motiva- tion to work (e.g., team attitude, task concentration, profes-	Cluster analysis of the sat- isfaction inventory yielded the following five dimen- sions: advancement, ethical principles, creativity, pay, and working conditions. Furthermore, motivational type acted as a moderator of the relationship between satisfaction and performance.	Landy (1971)
Telephone operators Service Assist- ants Group Chief Operators	39 14 7	suring overall job sat- isfaction, satisfaction with specific aspects of the job, job in- volvement, intrinsic work motivation, higher order need strength, and belief in the	Increasing the amount of variety and the decision- making autonomy in the opera- tor's job resulted in no  change in work motivation,  job involvement, or higher  order need satisfaction.  However, as a result of the  changes, the employees re- ported less satisfaction with  the quality of their inter- personal relationships.	Lawler, Hackman, & Kaufman (1973)
Scientists	291	attitudes, higher orde	The three types of attitudes measured were related differentially to job design factors and to job behavior. Satisfaction was related to amount of job control, job involvement to self-rated effort, and intrinsic motivation to both effort and performance.	
Middle and Lower Managers of Social Service Agencies and an Industrial Company	140		Satisfaction of higher order needs (e.g., self-actualiza- tion) was more strongly re- lated to performance than was satisfaction of lower level needs (e.g., security).	Lawler & Porter (1967a 1967b)
Managers	107	Porter Need Satisfaction Questionnaire	Data offered little support for the view set forth by Maslow and others that needs are arranged in a multi-level hierarchy. Instead, needs may be arranged in a two- level hierarchy with the basic biological needs on the bottom level and all other needs on the top level.	Lawler & Suttle (1972)
Theoretical			There are five sets of basic needs arranged hierarchically: physiological, safety, love, self-esteem, and self-actualization needs. Until the basic (lower level) needs have been satisfied, one cannot focus on the higher level needs.	Maslow (1943, 1965)
College Employees	75	Projective Techniques (e.g., TAT)	Findings indicated that dif- ferences in psychological heeds were not associated with differences in the kinds of job elements that were satisfying/dissatisfying. Therefore, Wolf's heed grati- fication theory of job satis- faction-dissatisfaction was not supported.	
Bank Employees	<i>1</i> 01		Employees who have strong growth needs and also are satisfied with the work content (e.g., pay, job security co-workers, and supervisors) respond more positively to enriched jobs than do employees who have weak needs for growth and/or who are dissatisfied with the work content.	gitaron una ala
Low-White Collar Employees in an Electronics Manufacturing Company	314		Low-white collar workers in units with a high promotion rate had an intrinsic value system, whereas workers in units with low promotion rates adhered more to extrinsic values. Furthermore, for low-white collar workers, the higher the promotion rates, the higher the importance of aspects which may satisfy	Pennings (1970)

Type of Worker or Company	N	Instrument	Major Findings	Reference
High and Low Skilled Operators	204	Porter Need Satisfaction Questionnaire	The results demonstrated that dissimilarities exist between Porter's need model for managers and the operators included in this sample. The findings in regard to security and self-actualization needs were different from findings reported by other researchers, and the authors concluded that more research is needed before generalizations can be made.	
First Line Super- visors in a Steel Fabricating Plant  Work Factors. Edward's Personal Preference Schedule.  Fabricating Plant  Relationship be ality traits an formance and sa with various en work factors ship there was no an difference in phowever, higher foremen perceiv		An investigation into the relationship between personality traits and role performance and satisfaction with various environmental work factors showed that there was no appreciable difference in personality; however, higher producing foremen perceived greater satisfaction.	Slocum, Miller, & Misshank (1970)	
Automobile and Chemical Manufac- turing Employees	81	Interview-Survey	Findings indicate the importance of work functions for psychological and social survival. Many of the "ego" demands must be satisfied in the work situation. Family and social participation cannot match the satisfaction available in successful job performance.	Sofer (1970)
Female First-level Supervisors in a Customer Service Department	133	Task Goal Attribute Questionnaire (TGAQ) Adjective Check List	Goal specificity and feedback on goal effort were signifi- cantly related to performance for high need achievers, while participation in goal- setting was significantly related to performance for low need achievers.	Steers (1974)
Telephone Company Employees	556	Job Descriptive Index Questionnaire investi- gating organizational commitment and sources of organizational attachment.	Findings showed that the job an individual holds is asso- ciated not only with atti- tudes about the work itself but also relates to other attitudes as well (e.g., satisfaction with pay, satis- faction with promotion pros- pects, etc.).	Stone & Porter (1975)
Electronics Manufacturing Workers Oil Refinery Workers	399 489	Questionnaire investi- gating ego-involvement satisfaction with job, health, and self, work related tension, and autonomy.	Persons ego-involved in their jobs are rated higher in job performance than those not so ego-involved.  Job satisfaction and satisfaction with self of persons ego-involved in their jobs is significantly more positively related to the amount of opportunity for self-expression in their jobs than in the case for persons low in ego involvement.	VIOOM (1962, 1964)
Review			Review of research literature testing Maslow's need hierarchy theory concluded that none of the studies yielded five independent need categories. Some evidence exists for two types of needs—higher and lower. Selfactualizing needs may emerge as an independent category, but it may not be a need but simply a social desirability response resulting from cultural values.	Wahba & Bridwell (1973
Telephone Operators	80	erence for various work	Higher order need strength (as opposed to urban vs. rural background and Protestant Ethic) is the best way to measure individual differences relevant to job redesign in regard to their usefulness as moderators of employee reactions to job characteristics.	Wanous (1973, 1974)

Type of Worker or Company	N	Instrument	Major Findings	Reference
Telephone Company Employees	208	Questionnaire requiring ratings (using a seven- point scale) of 23 job facets. Two direct-rating measures of overall job satisfaction.	Data on the relationship between each of 9 operational definitions of job satisfaction and 2 traditional measures of overall job satisfaction showed that operational definitions of job satisfaction do not yield comparable measures of satisfaction.	Wanous & Lawler (1972)
Manual Workers in Electronics Plants	2543	Forced-Choice Question- naite measuring fea- tures such as work itself, supervision, and social relations.	Self-actualization attitude factor, as measured by the questionnaire, was most related to overall job satisfaction and accounted for over twice the criterion variance accounted for by any of the other job attitudes measured.	Wild & Dawson (1972)
White and Blue Collar Workers	207	Likert-type job satis- faction scale. Need Gratification Index. Expectation Index and Critical Satisfaction Incidents.	Results of this study pro- vide general support for the expectancy theory of job satisfaction and job perform- ance, and did not support Maslow's theoretical position that lower level needs must be satisfied before upper level ones become active.	
Review article		Company of the second s	It is theorized that job motivation results from an individual's perception of the relationship between specific job-related behav- iors and desired need- gratifying consequences.	Wolf (1970)

to date has not established causal relationships. In addition, the area of practical applications of these variables to job design interventions may present severe economic, legal, and ethical problems.

The urban-rural and alienation variables may be too broad to allow for predictive validity. Research results are conflicting and depend upon the measure used or the conceptual approach. For example, the urban-rural distinction can be measured by current residence of the worker, past residence, area of birth, area of socialization, and combinations of any or all of these dimensions. Alienation is an amorphous concept, yet limited in that it fails to consider broader economic issues. It is still a debatable question if alienation in the work place permeates all facets of the worker's social and political life. Moreover, should job design efforts ignore the urban alienated worker and concentrate on rural workers where the payoff may be higher and labor and other problems are less severe?

Motivational states including intrinsic orientation, job involvement, and higher order need strength, are subject to the same problems in conceptualization and application. In addition, these approaches have not considered more basic differences in the cognition and ability level of a worker or the worker actually performing the task. Dunnette (1973) concluded from his review of the literature that ability level, rather than motivational states, was the more critical determinant of work behavior. Motivational approaches to worker behavior have either ignored or minimized the role of a basic ability dimension.

# Summary Statements

- (1) There is some evidence that rural workers respond more favorably to complex or enriched jobs.
- (2) Results are conflicting regarding the effects of Protestant Work Ethic and alienation from middle-class values on work behavior and reaction to job characteristics.
- (3) A significant positive relationship between satisfaction with the work itself and job scope holds for most segments of the work population regardless of their position on the alienation continuum.
- (4) Job involvement and intrinsic work orientation are motivational constructs which are difficult to operationally define.
- (5) Convergent validity was not established for three separate measures of intrinsic-extrinsic orientation: the Job Attitude Scale (Saleh), the Survey of Work Values (Wollack et al., 1971), and the Job Orientation Inventory (Blood, 1973).
- (6) Recent empirical tests of Maslow's need hierarchy theory have not been promising. There are problems in measurement of Maslow's categories of needs.
- (7) Hackman, Oldham, and others have developed a theory of job design which emphasizes the central role of higher order need strength as a moderator variable in the relationship of job structural attributes and psychological states to work outcomes.

## CHAPTER VIII

### OVERVIEW

The literature related to job design can be classified by a number of approaches that look at job design from different points of view and use different levels of investigation depending on the theoretical orientation and the scientific discipline. Each of these approaches makes certain implicit assumptions about the nature of man which are based on divergent models of man.

The early concern of job design centered on how much physical work a man could perform in a stated period of time. Work output was often considered to be the most important factor in job design. In the early 1900's, under the influence of individuals such as Taylor, this concern with the physical capacity of the worker was extended to include simplification of the task and the "one best method" to perform each individual job. Following the continued concern with physical exertion, attention was also paid to fatigue and rest periods as important determinants of task productivity.

This model assumed that productivity would be maximized by designing jobs for the person with minimal ability and motivation. Work simplification and the detailed specification of duties were believed to reduce the importance of ability and motivation levels. It was further assumed that there were no consequential interactions between individual attributes and the design of jobs which would influence productivity in an organization. At the next basic level is the ergonomics-human factors approach which narrows in on the task and the operator performing that task.

Then, the research of Turner and Lawrence (1965) and Blood and Hulin (1967) examined group differences as they interacted with job design. These investigators found that satisfaction and productivity appeared to be a function of the interaction between job design and group membership. Specifically, the rural worker tended to prefer a more responsible, larger job, while the urban worker appeared to favor the reverse. Here, for the first time was an explicit statement of the interaction between worker characteristics (shared culture) and job design. This research, however, still did not deal with individual abilities and attributes in their interaction with job design but focused on group and cultural values.

Another group of researchers have concentrated on the internal motivational state of the worker. Most recent job design projects have been based on the proposition that workers are motivated by intrinsic factors which are distinct from extrinsic goals and rewards. In addition, it is assumed that these intrinsic properties of a job or task are more effective motivators of work oriented behavior than extrinsic factors. The basic theoretical framework is Maslow's Hierarchial Theory of Motivation (Maslow, 1943) that postulates lower level economic security and safety needs, and higher level needs of self-actualization and creativity. When the lower level needs were met by society, these higher level needs emerged.

Herzberg's theory of intrinsic-extrinsic motivation and his job enrichment principles assumed that all men had some need to work at a meaningful task and that the "larger" job would bring

forth more of the latent motivational properties of an individual.

Again, the implication was that individual abilities and attributes would not interact with the job design. In addition, Herzberg believed that only experts should be involved in job redesign and that workers did not possess the expertise or knowledge to contribute to job enrichment.

Hackman, Lawler, and Oldham and others have adopted an expectancy theory approach to job design. They have identified five core characteristics of jobs which are assumed to elicit the following three positive psychological states: experienced meaningfulness, experienced responsibility, and knowledge of results. These states are inferred as critical to an individual's motivation, satisfaction, and performance on the job.

Another approach, a variety of congruence models, focus more on the individual, his perceptions, and his abilities, rather than a generalized motivational state (i.e., Barrett & Dambrot, 1975b; Morse, 1975).

At the highest level of investigation is the recent work of Lorsch and Lawrence (1972) on a contingency theory of organizations. In a study of four manufacturing and six research laboratories, it was found that effective unit performance was dependent on a three-way fit or match among three major factors. These factors included the internal environment, external environment, and personality dimensions of members of the organization.

Lawrence and Lorsch's theory is based on a broad conceptualization that is geared to current theories of motivation based on competence. Their emphasis on external environments may lead

job design out of the factory or the laboratory and into the world at large.

From this brief overview of some of the major theoretical positions, it is evident that there is very little commonality among the theories, and indeed, they are so disparate that it would be extremely difficult even to empirically compare or contrast two different theoretical positions.

Job design researchers with differing theoretical orientations have developed specific instruments to measure relevant constructs. The limited evidence available indicates that there is little relationship between instruments designed to measure essentially the same constructs. This proliferation of instruments is not unique to the job design field but also occurred in the early days of personality and intelligence testing. There is no easy or simplistic solution to this problem since every researcher and practitioner, particularly in the early formative stages of research, feels compelled to develop and use instruments which adequately measure variables and constructs judged to be important. In addition, researchers in new and evolving fields are not as constrained by traditional measures and techniques. Problems arise in that research results can not be generalized across tasks or samples.

Empirical field research is often not satisfactory because scientific precision, control and rigor is lacking. Relevant variables are either not measured, controlled, or considered as explanations for an observed phenomena. Field studies have not yielded data that allow the researcher to infer causality. Often

we do not know why a job design change was either unsuccessful or successful. However, some of the more recent field and laboratory studies are more sophisticated in terms of their experimental design and have included relevant, previously neglected variables of a worker's ability, competence, and task expectancies.

In addition to these measurement and control problems, a particularly difficult methodological consideration occurs when productivity is used as the dependent variable. If the job design changes result in modifying the existing method of performing the task, then as numerous human factors studies have documented, even a slight change in the method of performing a task may result in increased productivity, independent of the actual job design change or the variable being studied.

At this point in time, job design is approaching but has not reached the level of scientific maturity to allow an organization to predict with any degree of certainty the consequences of job design for the individual worker, the organization, the economy, or the society at large. However, job design has had a long history and has progressed and matured from the early work simplication studies to broad programs of job redesign which are of vital importance to a society which has just begun to question the meaning and quality of work life.

Ace, M. B., Green, C. B., and Davis, R. V. Biographic correlates of work attitudes. <u>Journal of Vocational Behavior</u>, 1972, 2, 191-199.

The correlation of six biographic variables (sex, age, school grade, future plans, geographic location, and sociocomess etatus) with work attitudes (measured by the Youth Opinion Questionnaire) was investigated for two large samples of high school students. Analyses included bivariate correlation, multiple correlation, reciprocal averages orediction, and cannaical correlation. Bivariate correlations were generally low. The six biographic variables in combination were significantly, but only modeatly, related to work attitudes. Sex was the major factor associated with work attitudes. Puture plans was the only other significant factor. So support was found for proposition that unhan-rural distinction resulted in differences in work attitudes.

Aldag, R. J., and Brief, A. P. Age and reactions to task characteristics. <u>Industrial Gerontology</u>, 1975, 2, 223-229. (a)

Report of a survey study of two sample groups which examined the differences between older and younger employees in reaction to task

Sample B consisted of 99 employers of the sample B consisted of 99 employers of the sample agency. Average age was 41 years (range 21-64). Average tenure was 7 years.

The subjects rated their jobs on variety, task significance, and autonory. General satisfaction, growth satisfaction, and higher erder med strength were measured.

Samples A and 8 were dichotomized at the age median into high and low age groups. Older workers in Sample A exhibited higher general satisfaction and growth satisfaction than did younger workers. In Sample B, the differences were not significant.

In meither sample were there significant differences between younger and older employees in perceived autonomy, skill, variety, er faedback from the job. Both younger and elder workers were significantly more satisfied with higher levels of these task dimensions.

Nowever, younger workers responded very unfavorably to jobe lacking significance and meaningful output; older workers did not.

Older workers responded much more favorably to jobe high on task identity. Tounger workers responded more favorably to jobe low on task identity. identity. Touses workers responded more survey, identity.
The findings refute some stereotypes that elder employees place many importance on extrinsic job factors.

Aldag, R.J., & Brief, A.P. Some correlates of work values. Journal of Applied Psychology, 1975, 40, 757-760. (b)

Pindings by Blood concerning relationships of work values to employee affective responses were replicated using a different easple (M-11) midwest hourly manufacturing exployees and different enseures of affective responses. Further eignificant relationships were found between work-value indices and employee perceptions of task characteristics and of leader behaviors. The common suggestion that adherence to Protestant Ethic ideals should be accordated with strong higher order needs was supported. Implications of the findings and suggested directions for future research are presented. Age was related to Protestant Ethic, but urbanisation of area of socialization was not related.

Alderfor, C.P. An organizational syndrome. Administrative Science Quarterly, 1967, 12, 440-466.

In this study, the concept of organizational climate was operationally defined as a series of relationships between need satisfactions and organizational variables. The needs in this investigation were pay, respect from superiors, and the use of shills and shill tide, while the organization variables were job complexity and sentority. (Me1700 employees manufacturing organization). The major findings were: (1) Satisfaction with respect from superiors decreased as job complexity increased and as sentority increased. (2) Satisfaction with the use of shills and abilities increased as job complexity increased and as sentority increased as job complexity increased and her carried out in the company showed both these effects. Employees holding enlarged jobs showed less satisfaction with respect from superiors and more actisfaction with opertunities to use their shills and abilities. Two emplanations were effected for the decay in superior-to-subordinate relationships. First, the more complex jobs required more interpersonal competence of both superior and sub-ordinate and, in the particular company studied, this job demand was not being adequately mot. Second, rapid company gravith and technological thence provided continuing source of career annioty and thee put additional strains in superior-to subordinate relationships. The was supported that this climate was nother unique to the particular coganization, mor general, but it reflected some of the consequence of supplied that this climate was nother unique to the particular coganization, mor general, but it reflected some of the consequence of supplied that this climate was nother unique to the particular coganization, mor general, but it reflected some of the consequence of supplied that the climate was nother unique to the particular coganization, mor general, but it reflected some of the consequence of supplied that the companisation and technological innovations.

Alderfer, C.P. Job enlargement and the organizational context. Personnel Psychology, 1969, 22, 415-444,

Reports on the findings of a job enlargement program carried out at a manufacturing plant for three years, and contains a brief literature review. The results of the study, comparing enlarged jobs and menlarged jobs, showed that employees with enlarged jobs were more satisfied with pay and work requirements. The enlarged jobs tended to increase problems of relations with superiors. Therefore, the resettions to the change were mixed. When introducing a job enlargement program, it is important to fully understand the implications of the program. Statistical data not reported.

Alexander, R.A., Belescoe, L.L., Barrett, G.V., O'Connor, E.J., Forbes, J.B. The relationships among measures of work orientatis job attribute preferences, personality measures, and ability. Technical Report No. 7, 1975, University of Akron. Contract B00014-74-8-0202-0001, NR 151-351, Office of Haval Research.

An analysis of test data gathered prior to any experimental treatments revealed that the instruments used to measure intrinsic and/or extrinsic orientation were not conceptually equivalent and furthermore, indicated that a substantial portion of the varience across instruments was attributable to the method. This suggested serious deficiencies in current measures of work existence. In addition, epencally small relationships were found to exist mong all of the premeasures used and that females were significantly more field dependent and intrinsically existence than makes, whereas makes measures additive was significantly greater than that of females.

Allen J.C. Multidimensional analysis of worker oriented and job oriented verbs. <u>Journal of Applied Psychology</u>, 1969, <u>53</u>, 73-79.

The purpose of the present study was to determine if a workeroriented vs. job-oriented (orientation) continuum was unidimensional
Provious research indicated that werbs from job descriptions could
be scaled along the orientation continuum. The multidimensional
method of successive intervals was applied to a sample of 20
proviously scaled werbs. From the responses of 36 college students
instructed to consider the verbs in terms of jobs five orthogonal
dimensions were obtained. It was concluded that the orientation
continuum existed, but that it was too complex to be considered
muldimensional. Research based on actual observed job behavior
is needed to establish the generality of the orientation continuum
end to determine if it is an adoquate construct on which to base
indirect validity.

Anderson, J.W. The impact of technology on job enrichment. Personnel, 1970, 47, 25-37.

Comments on job enrichment programs in ten companies divided into 4 groups: 1) Service companies (A747), 2) Seavy assembly empanies (Chrysler), 3) Light assembly companies (Treas Instruments), and 4) Processing companies (Proctor & Gamble). Discussed the similarties and differences of procdures in these companies. Concludes that further study of the job enrichment process is needed before an adequate model can be devised. Additional research is moded in the area of participation, compananties, the role of the moies in job enrichment, and the relationship hotoman job enrichment and companies.

Hinety-six students worked at 1 of 3 piece rates: equitable wage (300), underpay (130), or everpay (300). Half of these students worked on an inherently interesting task while the other half worked on an inherently dull task. As predicted, underpaid 30 maintained equity by increasing work quartity at the empance of work quality, whereas everpaid 50 maintained equity by refusing work quantity and increasing work quality. Over and above the job-performance difference between pisce-rate groups, there were presummed difference within pisce-rate groups, there were presummed difference within pisce-rate groups. Two other hypotheses, I about task difference and 1 about the relative offsites of underpay and everpay inequity, were not consistently expected by the date.

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Argyris, C. The individual and organization: An empirical test. Administrative Science Quarterly, 1959, 4, 145-167.

Study of 300 employees working in two separate divisions of one firm. Department A included highly-skilled craft employees in which an individual produced whole product mostly by hand. Department B consisted of unskilled and semi-skilled machine feeding tasks Formal organization policies, leadership and controls were the same for both departments; the only difference was technology. Department A employees in comparison to Department B were more concerned about the quality of their products, expressed a greater interest in their work, placed less emphasis on money as a reward, had a greater sense of self worth, made more friends at work and empaged in more greative activities outside of work.

Armstrong, T.B. Job content and context factors related to satisfaction for different occupational levels. <u>Journal of Applied</u>
<u>Psychology</u>, 1971, <u>55</u>, 57-65.

Test of Herzberg's theory and Darley and Hagenan's rational relative to occupational level. A sample of 200 engineers and 153 assemblers rated work on overall job satisfaction index and completed s job factor satisfaction scale which measured five job content factors and 8 content aspects. Results indicated that content-content factor dichotomy was not supported. Ratings of job-factor importance was a function of occupational level, engineers rated content factors as important and assemblers reted content factors as important. However, satisfaction with content factors made the greatest contribution to overall job satisfaction. The study concluded that both theories represent oversimplification.

Aroneff, J. Psychological needs and cultural systems. New York: Van Enetrand Reinhold Company, 1967.

Introduces a new approrch to the investigation and explanation of social phenomena, tasted through an empirical field study of different sub-cultur-s in a West Indian village. Author proposes that the organization of both culture and personality systems is the final product if three independent factors: environment, institutional determinants, and organismically-based psychological needs. Starting from the premise that psychological not social field, this study demonstrates that they have a strong reciprocal influence on one another, and that to understand properly the dynamics of either system one must discover the means and degree of their interaction.

To test this hypothesis, the author studied the economic workgroup and family organizations of fishermen and supercane cutters in a rural village on the island of St. Ritts. Using various techniques to isolate the separate factors, the artramely important differences found in the structure of those organizations were enalysed and traced back to the different sets of determinants proposed in the theoretical model.

Aronoff, J. Psychological needs as a determinant in the formation of economic structures: A confirmation. Human Relations, 1970, 21, 121-138.

Continuation of field study of fishermen and cane cutters (see Aronoff, 1967) reports changes over time. In 1962, the cutters were under the supervision of a head cutter and were organized into gangs of about eleven men. The whole work effort was organized by the head cutter, and the very authoritarian nature of the position allowed him to take advantage of the men in terms of both the amount of work and bayment for services. The pay was based upon the productivity of the whole gang, so the slowest worker was paid the same as the best.

Under a new pay system, in addition to weighing the cutting for each gang deily, a special "field man" estimated the exact tonnage each individual man resped. In this manner, individual productivity was directly related to the wages received.

It was possible to move to this new plan because a new generation of cutters had arisen. The 1970 came cutters were essentially a different work force. The needs of the new group of came cutters did not focus upon the physiological and safety needs, but upon the affiliative and self-esteen needs. As was predicted by Madlow's theory, this new group of came cutters had enjoyed a much more secuse childhood during their first twelve years of life he compared with the older group of cutters.

Aronoff, J., & Mosso, L. A. Motivational determinants of smallgroup structure. Journal of Personality and Social Psychology. 1971, 12, 319-324.

This paper reports an investigation of individual motivation as a determinant of group structure. Nale subjects high on either safety or esteem needs were homogeneously formed into 10 five-man groups. All groups were given a standardized set of tasks, and members' task-oriented behaviors were coded using Borgetts's Interaction Process Scores. As predicted, safety groups tended to establish a more hierarchical social structure, in that task-oriented behaviors consistently were concentrated in fover members in sefety groups then in settem groups. Thus, groups tended to organise themselves is very that were competible with the metivations of their numbers.

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Atkinson, A. P. C. Selection of the necessary but not sufficient skills for a job. <u>Human Pactors</u>, 1973, <u>15</u>, 125-128.

Briefly discusses the feilure of psychologists to produce high powered predictive tests for overall job performance. Suggests that candidates should be assessed not only in terms of shills found in the behavior of experienced workers but also in terms of main skills required during learning process. This approach requires mere sophisticated techniques of skills enalysis and perhaps would lead to greater predictive power.

Attneave, F. Applications of information theory to psychology. New York: Holt, Rinehart and Winston, 1959.

Summarizes existing informational methods used in psychological research, and illustrates the methods of calculating some of the measures. Chapter 1 develops quantitative expressions of uncertainty and redundancy from qualitative expressions of uncertainty and redundancy from qualitative examples. Chapter 2 describes informational methods for ensigning sequences of events. Chapter 2 gives methods of describing rates of transmission of information and reviews pertinent research. Chapter 4 concerns possible applications of information measures, particularly to the study of perceptual problems of patterning. Appendices illustrate the calculation ef information measures from variance statistics and provide convenient tables and a memograph weed in calculating information measures.

Bachman, J.G. Motivation in a task situation as a function of ability and control over the task. <u>Journal of Abnormal and Social Psychology</u>, 1964, 69, 272-281.

Psychology students (N-102) participated in the task of constructing and validating an "academic aptitude test." Training (level of ability) and amount of control over the task were manipulated in a 2 x 2 factorial design. For untrained Ss. performance was positively related to control. The performance of trained Ss were negatively related to control, contrary to prediction. This reversal was tentatively attributed to unintended "side effects" of the training manipulation. As predicted, expected success vas positively related to training, perceived ability, and perceived control. A manipulation of success and failure in the task led to results consistent with predictions: success produced increases in satisfaction and perceived ability, while failure led to decreases in perceived ability.

Badalamente, R. V., and Ayoub, H. H. A behavioral analysis of an assembly line inspection task. Banan Pactors, 1969, 11, 339-352.

The problem of sustained efficiency in monotonous perceptual tasks is particularly pertinent to industrial inspection. The present research analyzed the assembly-line inspection of products. By utilizing four basic schedules of defective product (fixed ratio, Variable ratio, fixed interval, and variable interval), it was demonstrated that the desection of defectives can serve as reinforcements for observing behavior. In addition, the vigilance decrement associated with the inspection task was shown to be a function of the differential reinforcement of observing responses.

Asthors concluded that the presentation of a high rate of signals is akin to differentially reinforcing a high response rate in maintaining attentive behavior throughout the monitoring task, thus preventing a vigilance decrement, both in terms of missed signals and false alarms. The application of these findings to actual industrial inspection tasks is possible, but must be accomplished with care.

The differential reinforcement of responding through a variable satio schedule is superior to other schedules in maintaining inspector efficiency throughout the watch.

It should be obvious that the conclusions reached through th's experiment are limited in their application to actual inspection tasks, such as those found in industry. For example, it has been pointed out that variable-ratio schedules are best in maintaining inspector proficiency throughout the watch. The ratio referred to here is the number of "observing responses" emitted to the reinforcement provided, i.e., the detection of a defective. In an actual industrial inspection task, it would be extremely difficult to either find or devise an appropriate observing response and then impossible to reinforce it on a set-ratio basis, since the occurrence of a defective cannot be predicted. We did, however, discover that a variable-interval schedule providing a high begani rate (in other words, a variable-interval schedule with a small or short interval) can also serve to maintain inspector proficiency. It might be feasible, in a particular industrial inspection situation, to program a certain temporal pattern of known or artificial defectives ento the inspection line in order to form a (comwhat variable) variable-interval schedule is combination with maturally occurring defectives. Revever, this type of control should not be attempted heatily. A great deal more study is required which more clacely approximates estual industrial situations before the techniques discussed can be applied with confidence.

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Bakan, P., Belton, J.A., & Toth, J.C. Extraversion-introversion and decrement in an auditory vigilance task. In Donald Buckner's (Ed.) <u>Vigilance:</u> <u>A symposium</u>. New York: McGraw Hill, 1963.

Study of 62 extraverted 62 introverted and 21 normal (median extraverted-intraverted) who participated in a 48 minute auditory vigilance test divided into three 16 minute periods. Half of subjects in each condition took the tests under a group or social condition; half alone or in an isolated condition. The evidence from this experiment supported the hypothesized relationship between the personality dimension extraversion-introversion and tendency to decremental performance over time in a vigilance task. The present data suggested, however, that the relationship is not a linear one, since the extravert curve and the normal curve were alike in showing decremental tendencies. It was the introvert alike in showing decremental tendencies. It was the introvert alike in performance with continued performance may be the characteriatic tendency for the majority of people, with the extreme introvert representing a minority that is less likely to show such decline. This snalysis is consonant with the fact that in most vigilance experiments where subjects are not selected, there is an average tendency to decremental performance with time, since in any such group extreme introverts would constitute a minority.

If the decline in signal detection over time is thought of as being due to extinction of attentive responses due to infrequency of signal occurrence then one must look for factors producing more resistance to extinction for introverts. It may be that for the introvert in a vigilance task there are reinforcers other than signal occurrence which sustain attentive response at

The interaction between the isolation variable and extraversion-introversion, though not statistically significant, was suggestive. The extravert appeared to benefit from the social condition, whereas the introverts performed better in the isolation condition. It should be noted that the social condition in this experiment was not as social as it might have been, since during the vigilance task, the subjects were visually isolated from each other. Further research along this dimension might be profitable.

Baker, S.H., Etzioni, A., Hansen, R.A., & Sontag, M. Tolerance for bureaucratic structure: Theory and measurement. <u>Human</u> <u>Relations</u>, 1973, 26, 775-786.

Reports on conceptualization and measurement of a dimension of personality-tolerance for structure.

The instrument developed (Tolerance for Bureaucratic Structure involves four related areas, namely; attitude toward rules and regulations, attitude toward authority, orientation ward tasks, and orientation toward delaying gratification.

For the purposes of analyzing the interrelationships between the separate areas, four subscales were computed, composed of questions in each of the above areas, in addition to a total score. The final scale consists of 43 items selected on the basis of item analysis and the degree to which items were repre-sentative of the construct. This selection was made on the basis of point-biserial correlations with the total as well as area subscores.

Items on the scale represent each of the four areas as follows: fifteen, rules and regulations: eleven, authority; seven, task; and ten, delay of gratification. The proportion of items selected from each area was roughly congruent with an a priori decision about the importance of the area to the construct. The following items illustrate each area.

Oscutions related to rules and regulations:

1. Even if I do not like a rule, I usually obey it.

2. Often, the only thing wrong with breaking rules is getting

- Questions related to authority:

  1. The worst part about working is having to take orders.

  2. I often get and when I am told what to do.

- metions related to task:

  1. I would like a job where I had more control over the way
  I work.

  2. I like to work at a steady speed.

- Questions related to delay of gratification:

  1. It is important to save a regular part of your calary each week.

  2. That happens to you in life depends on hard work.

3, that happens to you in life depends on hard work. In measuring individuals' orientations toward such job requirements, that is, their level of tolerance for them, workers are asked to give their degree of agreement or disagreement with statements about various characteristics of jobs. Through their answers, workers indicate what saspects of jobs they find most desirable and those they do not. Respondents were asked to answer in terms of what they would like and not what they expect about a job they might or do hold. The items of the scale are worded in such a way that agreement with an item is scared as tolerance for bureaucracy in about half of the items, while in the other half, disagreement indicates tolerance. In each case the most bureaucratic response was scored as four and the least bureaucratic response was scored as four and the least bureaucratic response as zero. There was no undecided category, but omissions were scored as two.

Crombach's alpha reliabilities are reported to be in the

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The data suggests that the Tolerance for Bureaucratic Structure instrument taps such an analytic dimension of peoples orientation to their work roles. The relationships between TBS, work history and performance evaluations are small but significant, indicating that the relationship between this dimension and workers' behavioral and attitudinal responses to a variety of different jobs merits further study.

Baker, S.H., & Hansen, R.A. Job design and worker satisfactions A challenge to assumptions. <u>Journal of Occupational Psychology</u>, 1975, 49, 75-91

Some recent job redesign efforts in the United States, introduced to counter worker dissatisfaction and low productivity, represent a shift from more traditional but still prevalent models of worker-employer relations. This paper presents data from a study of blue-collar and white-collar semi-skilled American workers (total M=179 blue-collar snd M=384 white-collar) which challenge two basic assumptions of these newer efforts: (a) that small changes in job design (here conceptualized as 'de-structuring' work roles) are sufficient to affect worker satisfaction; and (b) that matching employees' work orientations (here, their 'tolerance for structure') with the nature of their jobe (its degree of 'structure') will improve worker satisfaction. The concepts 'structure' and 'tolerance for structure' are discussed in operational terms. The findings indicate that modest differences in the structure of jobs are not systematically related to job satisfaction and that there is no interaction between these workers' orientations and the nature of their jobs which influences satisfaction within this rangeof jobs. Education was negatively related to workers orientation to a structured job and age was positively related. There was a definite linear relationship between tolerance for structure and job satisfaction in all sites using all measures.

Beker, R.A., 6 Mare, J.R. The relationship between vigilance and monotonous work. <u>Ergonomics</u>, 1966, 9, 109-114,

Compared 40 subjects performance on 4 different routine monotonous tasks: (1) simple vigilance; (2) beam sorting; (3) simple assembly; (4) two digit addition: Performance was scored in terms of errors, units produced and missed signals. Intercorrelations among 4 tasks indicated that vigilance performance was not re'sted to the other 3 tasks. Vigilance tasks may contain unique sepects (s.g. lest of automaticity and inshility of 8 to control pace of work) not found in other monotonous work.

Beichin H. Satisfaction in work. Occupational Psychology, 1947, 21, 125-134.

Review of three phases in attitudes toward work:

(1) Agricultural work in which ther, was satisfaction
in the work as it involved a struggle against nature.

(2) Industrial work which involved long hours, exhaustive physical effort and an economic struggle. (3) Modern industrialism with a lack of a struggle against
anything. In the past the bases of work was a forcenature of economic pressure which obliged a man to work
and satisfaction came from combating these pressures.

Balchin advocates making work itself satisfying. "What
I am urging is that instead we should seek to destroy
the concept of "work" as a thing apart from the rest
of life. And this would involve us not only in making
work less unpleasant but in the such bigger job of
making it positively pleasant." (page 133) "We are reaching a
stage where seither management nor gociety wait be an
a position to demand from any man work which is not enjoyable or satisfactory. This may will man that society
may have to do without some jobs that it has been able
to get geople to do in the past." (page 133)

Baldamus, W. <u>Efficiency and effort</u>. London: Tavistock Pub-lications Ltd., 1961.

An analysis of problems in industrial administration, uthor in integrating provious research results views industrial onflict as incongruence between needs and expectations of the sployee and those of his organisation or employer.

Labor turnover, absentseism, wage structures, wage disparity, fatigue, work motivation, industrial strikes and work are reviewed in the above context.

The low skill level of a worker is related to greater absen-teeism on Mondays, greater labor turnover, fatigus, and low moral obligation to work.

Mage disparity in which the effort demanded is not congruent with his wags emportation is associated with conflict and strikes.

Seaks, O. The attitudes of steelworkers to technical change.

Interview study of sample of 270 steelworkers. The men were involved in a technical change. Two old melting shops were replaced by a single new shop of the most modern design including blest furnaces and coke ovens and maintenance functions.

Study concluded that there was no evidence of any widespread hostility to technical change even amongst redundant workers or those whose earnings had decreased as a result of the change. Bor did older workers show any very noticeable trend to conservation even though younger men had benefited more from the change. Production workers who had tended to gain more from the change than maintenance workers were more favorable to the change. Opposition to the change was most likely associated with low status production workers with the belief that their earnings had decreased as a result of the change.

It should be noted that displaced workers were not laid off placed in equal status, equal paying jobs. Company should seeful assimilation of technical change.

Barnes, R. M. Hotion and Time Study: Design and Measurement of Mork. New York: Wiley, 1968, Sixth Edition.

Presents basic principles that underlie successful application of motion and time study. Each principle is supplemently illustrations and practicel examples. Chapters include a considetion of definition, history, and applications of motion and time study; techniques of motion and time study; techniques of motion and time studies, principles of motion accessory; training motivation and other related topics.

Barrett, G.V. Symposium: Research models of the future for industrial and organizational psychology. Personnel Psychology. 1972. 25. 1-17.

Report of symposium that involved three different aspects of research in industrial and organizational psychology, (1) characteristics of major advances in science, and in the social and behavioral sciences in particular, (2) characteristic ways industrial and organizational psychologists conduct their research, and the research requirements in these areas for the seventies, (3) considering the above two areas, what are the optimum approaches of industrial and organizational psychology research to meet the requirements of the future.

Concludes that field should not generate another 4,000 studies on job attitudes without enough standardization to allow knowledge to accumulate. Ominously, a new fed has already appeared on the horizons Studies in "organizational climate." Each investigator has chosen to define the construct in his own special way. If we don't standardize on the meaning of this construct, 50 years from now it will be in the same morase into which job suttefaction studies have already sunk. Research for seventies remarges.

- 1. Standardization & replication

- Standardization & replication Research funding More valid instrumentation Involvement in large programs Greater concern strong relationship Better dissemination research results More research from non-scademic psychologists Test validity of theories
- 9. Research on paradique 10. Systematic research

Barrett, G.V., Base, B.M., O'Connor, E.J., Alexander, R.A., Forbes, J.B., & Cascio, M.F. Relationship among job structural attributes, retention, aptitude and work values. Technical Report No. 3, AD No. A014466 May 1975, University of Akron. Contract N00014-74-A-0202-0001, NR 151-351, Office of Naval Re-earch.

Report of field studies involving nonsupervisory Naval maintenance and monitoring electronics personnel. Results indicated that Naval retention was related to a number of individual and job attributes. Extended Naval tenure was associated with lower verbal and clerical aptitudes (Naval Test Battery); higher levels of active preference, pride in work, personal relations, and satisfaction with supervision and the work itself; a less explicit description of the future; and a belief that others shape and control ones future. The Attribute Preference Scale/Attribute Descriptions Scale (AFS/ADB) was developed to measure descriptions of current jobs and job structural attribute preferences. Results showed that Haval personnel who indicated a greater discrepancy between preferred and described job attributes characterized their oursest jobs less favorably.

Berrett, G.V., Cabe, P.A., Thornton, C.L., & O'Connor, E.J. Belations between field dependence and reactions to changes in job attributes. <u>Journal of Applied Psychology</u>, 1975, Vol. 60, No. 5, 649-651.

This study was designed to investigate the relationships between cognitive style and the articulation of durations of satisfaction/diseatisfaction resulting from changes in 13 job attributes. Subjects completed the Bidden Figures Test, three series of the rod-and-frame test, and a job attitude question-maire. It was hypothesized that field-independent technical personnel would report longer lasting satisfaction or diseatisfaction in response to changes in specific job attributes than their more field-dependent peers and that their reported responses would be better predicted by the rod-and-frame test as a measure of cognitive style than by the Eidden Figures Test. Both hypotheses were confirmed in a sample of 10 male engineers and technicians.

Barrett, G.V., & Dambrot, P.H. Conference report: Job analysis, job design, and job derived employment criteria. Technical Report Bo. 2, AD No. A014465, March 1975, University of Akron. Contract M00014-74-A-0202-0001, NR 151-351, Office of Haval Research. (a)

Report on a working meeting of research contractors involved in job analyses, job design and job derived employment criteria. The meeting included a consideration of task taxonomy, structured job analyses, task inventories, and the relevance of these methodologies to selection, training and job design. Research results from field and emperimental simulation studies were re-ported and discussed.

Barrett, G.V., & Dambrot, F.H. Final Report: Field and laboratory etudies for increasing the intrinsic reward value in navy jobe and careers. Technical Report No. 8, August, 1975, University of Akron. Contract H00014-74-A-0202-0001, NR 151-351, Office of Heval Research. (b)

Pinal report of field and laboratory studies of monitoring and maintenance tasks conducted within the context of a conceptual framework integrating job structural attributes, individual abilities, values and orientation, job performance and satisfaction and organizational tenure.

Barrett, B.V., Forbes, J.B., Alexander, R.A., O'Connor, E.J., & Balascoe, L.L. The relationship between individual attributes and job-design: Monitoring tasks. Technical Report No. 4, AD No. A018265, June 1975, University of Akron. Contract H00014-75-A-0202-0001, NR 151-351, Office of Naval Research.

Two visual monitoring tasks were developed, one high in job complexity, variety responsibility, and external feedback, and one low on these job structural attributes. Performance and eatisfaction on these tasks were related to individual difference in perceptual style, general intellectual ability, personality and work preference measures. The results indicate that complex interactions between individual and job structural attributes determine task performance and satisfaction.

Barrett, G.V., O'Connor, E.J., Alexander, R.A., Porbes, J.B., & Balascoe, L.L. The relationship between individual attributes and job design: Raintenance tasks. Technical Report No. 5, AD Me. A018264, June 1975, University of Akron, Contract N00014-74 A-0202-0001, SR 151-351, Office of Maval Research.

Report of a study of a simulated maintenance task in which subjects worked under two different sets of expectation. In the high job structural attribute condition, subjects were told that the maintenance task was high in responsibility, feedback, and the opportunity to learn new skills. In the low job structural attribute condition, they were told that the task was low on these attributes. However, subjects in both conditions completed the same physical task during the experimental session. The results indicated that those psychologically manipulated expectations of task structural attributes moderated the relationships between shilty measures and both quantity and quality of perferences and task estisfaction.

Sees, P.H. Social behavior and the grientation inventory: A review. Psychological Bulletin, 1967, 58, 260-292.

A review of research between 1959 and 1967 relating Orientation Inventory (Ori) scores to various other self-reports and to performence in controlled emperiments. Although many of the studies are based on small samples and Ori scales are relatively low in retest reliability, the overall patterns of results suggest the utility of assessing orientation as a way of increasing understanding of performence in a variety of social situations. In many situations the greatest source of variance may be the interaction of individual erientation and the nature of the task. What is punishing for the self-oriented may be of me consequence to the interaction-oriented and positively teinforcing to the task-oriented.

Base, B. H., & Berrett, G. V. Man, work and organizations: An introduction to industrial and organizational psychology. Boston: Allyn & Bacon, 1972.

An introduction to the field of Industrial/Organizational Psychology. The book is divided into six major parts. The first part introduces the fields of industrial and organizational psychology and briefly discusses some methodological research issues. The second part deals with organizational psychology topics including motivation, attitudes, and management. The third part deals with personnel psychology issues including selection, appraisals, and training. The fourth part concentrates on the worker and his equipment and physical environment. The fifth part views ann in the market place. Consumer psychology and progress in advertising and selling are covered. The sixth and last part reflects some recent concerns of industrial and organizations psychology. The emergence of multinational organization poses special problems for the industrial and organizations psychologist. The recent prominence given to behavioral acience and public policy is reflected in the last chapter.

Baumgartel, R. & Goldstein, G. Some human consequences of technical change. <u>Personnel Administrator</u>, 1961, <u>24</u>, 32-40.

Reports results of field experiment involving 150 skilled aviation mechanics. Helf of the workers were employed in an old plant in which the job ellowed full use of mechanical skills, considerable worker freedom and the development of interdependent work crews. Maif of the workers were moved to a new faculty which involved the introduction of assembly lines, work simplification and specialization, closer accounting control, and conveyor systems. Pre and Post attitude questionnaires indicated that despite considerable technical improvement in factory design mechanization work methods and conditions all of which were perceived as improvements by the workers, there was increased entagonism toward line supervisions and decreased group solidarity in the new plant. New plant and job changes resulted in loss of worker status, curtailment of job freedom, reduced esciel interaction emong workers, and more formal production-oriented relations with supervisors.

Bavelas, A. A mathematical model for group structure Applied Anthropology, 1948, 2, 16-30.

Presents a mathematical model of groups based on Lewin's theory and topology. The main objective of the paper is to define a possible geometry for dealing with psychological space and to explore in a limited way the consequences of a particular set of assumptions and definitions. The basic assumptions of the model are as

(1) The space being dealt with consists of collections of

cells.
(2) A cell is equivalent to a point or position in the

apace.

(3) A given cell may or may not be touching another cell.

(4) If a cell A<sub>1</sub> is touching another cell A<sub>2</sub>, then cell

A<sub>2</sub> is said to be touching cell A<sub>1</sub>.

(5) A cell cannot touch itself.

Be then defines 17 aspects including boundaries of cells, regions, chaims, and structure. He also specifies and compares three types of structures.

(1) an organisation in which a subordinate communicates only with his superior and with his subordinates (2) an organisation in which a subordinate communicates with his superior, the other subordinates of his superior, and his own subordinates (3) an organisation in which a subordinate communicates with his superior, all subordinates on his own level, and with his own subordinates

Bocker, S.W., & Beloff, W. Organization structure and complex problem solving. <u>Administrative Science Quarterly</u>, 1969, 14, 260-271.

Studied problem solving behavior of graduate business students in business game-simulations under three organizational structures. Assults supported hypothesis that division of labor form of organization was superior to committee and hierarchical organization. Interaction effect was found between organization structure and rates of improvement in performance and was greatest in groups showing low levels of initial performance.

Seer, M. Beeds and need satisfaction among clerical workers in complex and routine jobs. <u>Personnel Psychology</u>, 1968, <u>21</u>, 209-222.

Compared need satisfaction patterns on Maslow's need hierarchy for two categories of clerical jobs (routine vs. complex). Sample consisted of 4d clericals in complex jobs and 85 clericals in routine jobs from insurance company. Measures included preference inventory (Maslow's need hierarchy), job inventory, and self-description inventory. There was no substantial difference in need satisfaction patterns between clerical employees in routine jobs and those in more complex clerical jobs. Similarly, no difference was found in the motivation of these two groups. It was concluded that jobs which appear to management as higher in responsibility and complexity, and which are commonly viewed as promotions, may not always provide additional satisfactions in self-actualization, autonomy, or esteem. This study focused on the importance of defining accurately what constitutes job enlargement. An increase in variety and responsibility does not mecassarily result in increasing higher order need satisfaction or motivation. Now such job enlargement makes a difference in these variables is still open to question and must be the subject of further investigation.

Belbin, R.M., & Stammers, D. Pacing etress, human adaptation and training in car production. <u>Applied Ergonomics</u>, 1972, <u>1</u>, 142-146.

Field study of 300 semi-skilled and unskilled operators in interior and exterior trim department of an automobile plant. Paced systems of production results in stress through forcing longer than standard work cycle times into a fixed time allowance. Operator strategies to reduce stress include collective strikes, unauthorized line stoppages and transfer to other work. Problems include lack of rest breaks and desire for maximum earnings. Propiece solutions include off-track training, assured rest breaks and differential payment for skill.

Bell, G.D. Vagiety in work. <u>Sociological and Social Research</u>, 1966, <u>50</u>, 160-171.

Interview study of 186 full time day shift employees of a small community hospital. Study was concerned with work variety and amount of work discretion. Job variety was measured by counting the number of different tasks a worker performed. Amount of discretion was measured by three questions involving how many tasks, they used their own judgment in deciding to work on, the method of task completion and on the order of task completion.

Span attention of supervisors is the numb tasks supervisors oversee. Main results are:

the higher the discretion level of a job the more variety in the job.
 the larger the number of different tasks a supervisor performs the larger their spens of attention and the more varied their work.

Dell, R. A., & Symington, L. E. Watchkeeping performance as a function of certain properties of the viewing situation. <u>Numan Factors</u>, 1974, 16 (1), 65-69.

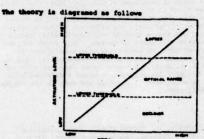
Subjects performed a 90-minute watchkeeping task requiring the detection of a plus sign which occasionally appeared in a matrix of solid circles. Irapendent variables were: (1) number of stimulus elements in the display; (2) location of those elements relative to the strong contours produced by the physical boundary of the viewing field; and (3) distance of the observer from the display. Average detection time for successive 100-tries blocks revealed the cowmonly observed vigilance decrement. Detection times were consistently shorter when a wider expanse of surround separated the stimulus array and the physical boundary of the display. They were not influenced by either stimulus density or viewing distance. Accuracy of response was found to deterlerate with an increase in stimulus density but was unaffected by the precimity of the display contours to the stimulus array or, again, by viewing distance.

Sennette, C.A. Towards empirical practicable comprehensive task tamonomy: <u>Muran Factors</u>, 1971, <u>13</u>, 229-235.

Reviews two approaches to task taxonomy: rational approach and empirical approach based on factor analysis. A third approach to developing a task taxonomy based on a semantice is described. A sample of 16 college students rated 10 familiar tasks (e.g. mowing a lawn, building a hi-fi etc.) on 25 werbs. Subject had to rate on a 4 pt. scale if the verb was applicable to the task. The data was analysed by a principal-components factor analysis with machine rotation. The results indicated the following four broad task dimmesions or factors: cognitive, social, procedural, and physical. Major problems in task taxonomy include the use of job-orienced rather than work-orienced verbs and the inability to define the level or the size of the task.

Bergum, B. O. A taxonomic analysis of continuous performance Perceptual and Botor Skills, 1966, 21, 47-54.

A conceptual framework is presented, based upon an expanded concept of activation level, which is designed to encompass the full range of performance.cask research, from vigilance to production-line type performance. Specific characteristic abstrations in performance are associated with specific extrems deviations in activation level and a matrix of task characteristics is developed for relating tasks in terms of their total stimulation value and for predicting the effects of experimental variables on the performance associated with those tasks.



Bypothetical relationship between activation level and total

More is a Matrix of Continuous Performance Tasks

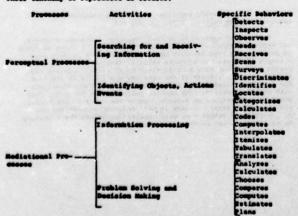
Stimulus		Degree of Stimul	ree of Stimulation	
	Low(1)	Moderate (2)	High (3)	
Source	(Vigilance effect)	(Efficient performance)	(Lapses and	
Relevant	Simple Low frequency	Complex	high variability) Continuous-Compound	
	Aperiodic	High frequency Periodic groups	Continuous Periodic	
Mediation	Transduction Low reactivity	Choice making	Combination	
	Low activation	Moderate	Over-reactivity High activation	
Reaction	Simple Low motor	Chained Moderate motor	Complex chained	
	Infroquest	Proquent motor	Continuous	

Berkowitz, L., & Daniels, L.R. Responsibility and dependency. Journal of Abnormal and Social Psychology. 1963, 66, 429-436.

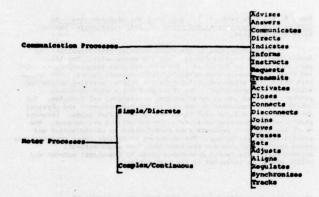
In 2 experiments the Se ware "workers" operating under the supposed guidance of their peer (a stranger) who was playing the part of their "supervisor." The men in the High Dependency condition were informed that E's evaluation of the supervisor would depend largely upon their productivity, while the Low Dependency Se were told that this evaluation would not be affected by their performance. There was a significantly greater performance in the Eigh Dependency condition. In general, the Low Dependency Se worked harder when told that the supervisor would soon learn of their performance than when they had been informed that he would not find out about their productivity until much leter. The immediacy with which the supervisor would learn of S's productivity did not affect performance under high dependency, however. The Se in this condition worked relatively hard presumably because of a feeling of responsibility to the dependent poer.

Berliner, C., Angell, D., & Shearer, J.W. <u>Bchaviors, measures</u> and instruments for performance evaluation in simulated environments. Peper presented at the £, paperius and Workshop on the Quantification of Suman Pefermance. Albuquerque, S.M., Augus: 17-19, 1844.

Reports the development of a classification of 50 behaviors under (1) perceptual, (2) mediational, (3) communication and (4) motor processes which may be viewed as mutually exclusive subclasses. Their tamonomy is reproduced as follows:



1950年,



Bets, E.L. An investigation of job satisfaction as a moderator variable in predicting job success. <u>Journal of Vocational Behavior</u>, 1971, 1, 123-128.

Hypothesized that job satisfaction functions as a moderator variable in the prediction of job success from ability test scores. Two groups of male and female assemblers were divided into high, middle, and low job satisfaction subgroups. For each subgroup, regression equations were developed to predict 2 criteris of job success (average productivity and supervisors evaluation of performance) from ability measures. Multiple correlation coefficients were statistically significant for the male high job satisfaction subgroup on the productivity criterion. Prediction equations were not significant for any of the middle or low job extisfaction subgroups. Results tend to support the hypothesis.

Betz, E., Weiss, D.J., Dewis, R., England, C.W., & Lofquist, L.B. A concept of work adjustment. <u>Vocational behavior: Readings in theory and research</u>. Hew York, Holt, Rinehart, & Minston, 1968.

Presents a theory of work adjustment based on nine propositions.

Proposition I. An individual's work adjustment at any point in time is defined by his concurrent levels of satisfactoriness and satisfaction.

Proposition II. Satisfactoriness is a function of the correspondence between an individual's set of abilities and the ability requirements of the work environment, provided that the individual's needs correspond with the reinforcer system of the work environment.

Proposition III. Satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's set of needs, provided that the individual's shillties correspond with the ability requirements of the work swirromant.

Proposition TV. Setisfaction moderates the functional relationship between satisfactoriness and the correspondence of the individual's ability set with the ability requirements of the work and correspondence.

Proposition V. Satisfactoriness moderates the functional relationship between astisfaction and the correspondence of the reinforcer system of the work environment with the individual's set of needs.

Proposition VI. The probability of an individual's being forced out of the work environment is inversely related to his measured satisfactorisess.

Proposition VII. The probability of an individual's voluntarily leaving the work environment is inversely related to his measured satisfaction.

Proposition VIII. Tenure is a function of satisfactoriness and satisfaction.

Proposition IX. The correspondence between the individual (abilities and meeds) and the work environment (ability requirements and reinforcer system) increases as a function of benure.

Bieri, J. Cognitive complexity-simplicity and predictive beh Journal of Abnormal and Social Psychology, 1953, 51, 263-268.

Journal of Abnormal and Social Psychology. 1955, 51. 263-268.

A theoretical approach which conceives predictive behavior to be a function of one's perceptions of others is presented as a means of unifying certain empirical data ordinarily subsumed under the labels of social perception, empathy, or social sensitivity. The viewpoint taken is that all these forms of behavior rest operationally upon the predictive behavior of the individual. Further, this predictive behavior is assumed to be dependent upon the inter-personal discriminations or constructs which the individual invokes in making his predictions. The complexity of an individual's cognitive system relative to the degree of differentiation smong his perceptions of others should thus affect his predictive behavior. Two major hypotheses were derived: (a) There should be a significant positive relationship between degree of cognitive complexity and predictive accuracy, and (b) there should be a significant megative relationship between cognitive complexity and assimilative projection. These hypotheses were tested on a sample of 34 5s each of whom predicted the behavior of two classmates on a Situations Questionnaire. Both of the hypotheses were supported by the data. By considering the component scores of predictive accuracy and assimilative projection, these relationships were further explored. Thus, cognitive complexity relates especially to the tendency to predict accurately the differences between oneself and others. Similarly, the tendency to engage in inaccurate projection concerning the similarity between self and others relates significantly to cognitive system for perceiving others is effectively related to one's tendency to engage in assimilative projection in such behavior. Certain suggestions for further investigation are discussed.

Bieshevvel, S. One more time, how do we motivate the Herzberg theory? Psychologia Africana, 1975, 16, 33-44.

As work motivation, whether in response to environmental or work-intrinsic factors, arises from needs which differ from person to person and according to circumstances, there is no justification for singling out the intrinsic factors as motivators and for describing people who are motivated by environmental factors as "hydene seekers." The view that satisfaction and dissatisfaction are unipolar variables, associated respectively with intrinsic and extrinsic work circumstances, conflicts with established psychological theory which sees dissatisfaction and satisfaction as the mental states respectively before and after the gratification of a need. Humerous work motivation studies in fact support this basic theory. The contrary evidence which led to the formulation of the Two-Factor Theory is the outcome of Bernberg's methodology, which cannot claim greater validity than the techniques of enquiry used by other investigators. The paper discusses the methodological problems in detail. Hew local experimental data are analysed in support of the theoretical arguments put forward in the paper.

Biganne, J.F., & Stewart, P.A. <u>Job enlargement: A case study</u>. Research series No. 25, 1963, State University of Iows, Bureau of Labor and Management.

Reports on job enlargement project at Maytag company plant in Mewton, lows. Conveyor paced group assembly jobs were enlarged at that each operator had responsibility for a complete assembly including testing and correction of defects. Cycle time was increased from 0.50 minutes to nine minutes. Authors report improve quality, lower labor costs, higher production, improved worker morals and involvement with the job. Statistical data is not presented.

Bills, M. A. Relation of mental elertness test score to positions and permanency in company. <u>Journal of Applied Psychology</u>, 1923, 7,

Study of 133 clericals working at 5 distinct non-supervisory jobs. The correlation between a list of mental alerthese and the level of difficulty of work performed by the individual was +.22 for the original group. For the group remaining after 2-1/2 years, the correlation was

Results are explained on the basis of natural selection. Indivi-duals of high mental alertness leave low level jobs, and individuals of low mental alertness cannot handle the work and leave.

Sishop, R.C., 6 Hill, J.W. Effects of job enlargement and job change on contiguous but nonmanipulated jobs as a function of workers status. <u>Journal of Applied Psychology</u>, 1971, 55, 175-181.

Study of 48 workers in sheltered workshop randomly assigned to work groups on a sorting task. Eight experimental work groups were established (job enlargement vs. job change without enlargement, change of low status workers in presence of high status workers whose jobs remained the same and vice versa). Results indicated no significant differences in quantity of output under any of the experimental work conditions. Mon-manipulated workers improved in quality. There was a decrement in quality in job enlargement condition. No differences were found in job satisfaction or tension on basis of job enlargement or job change condition. Low status workers tended to be favorably affected by job manipulation and unfavorably affected in non-manipulation condition due perhape to double Hawthorne effect. Study concludes that effects of job enlargement involve a complex combination of factors.

Björk, L.E. An experiment in work satisfaction. Scientific American, 1975, 232, 17-23.

Description of work restructuring project at Atlas Copco Mining and Construction - Sickla Work (Stockholm, Sweden). Conveyor belt assembly line for assembly of drills was replaced by a large table at which workers could assemble drills at their own pace and using their own method. Belt technology was used as a means of transporting the heavy steel components, but its speed was controlled by workers. In addition, work groups were formed. Two - four men would take a drill lot through the entire production process duties formerly assigned to foremen were taken on by workers - (e.g. check on delivery of component parts). Productivity increased 5%. Absentesism and turnover were low before the experiment began and have not changed. Morale improved. Experiment took three years and only involved 12 men. Further change and diffusion throughout the industry is dependent on labor organizations in Sweden.

Blackler, F.H.M., & Brown, C.A. The impending crisis in job design. <u>Journal of Occupational Psychology</u>, 1975, 48, 185-193.

design. Journal of Occupational Psychology. 1975, 48, 185-193.

While job redesign ideas are currently attracting widespread interest, threats to their future acceptability can be identified. First, concerning relevant analysis and research, a confusion of terminology exists in the field and the practical implications of job redesign theory may not be fully understood. While considerable rhetoric has been associated with presentations of job redesign aleas, research designs have been weak with the claimed results of particular exercises confounded to an unknown extent by extraneous variables. The field is ripe for a disenchantment which might involve a loss of the insights previously gained. Second, concerning general approaches to the field, little effort has been made to explore the value implications of evaluation procedures commonly used. Redesign exercises are studies in managerial terms of their success in providing more humane but also in essence more efficient ways to utilize 'human resources'. A convergence of organizational and individual requirements is assured. This leaves unexamined, and may even support, structural organizational arrangements perhaps as psychologically debilitating as simplified work. To overcome such problems a distinctively esychological approach should be followed and new research designs embloyed Rodels of personality and human potential should be further developed, with current job design and organizational practices examined exclusively in terms of them.

Blake, M.F.J. Time of day effects on performance in a range of tasks. <u>Psychonomic Science</u>, 1967, 9, 349-350.

Investigated performance on 8 tasks (e.g. vigilance, reaction time, time estimation, letter cancellation, calculations, digit span,etc.) at five times a day from 8:00 A.M. to 9:00 P.M. In repetitive tasks, there was a consistent tendency for improvement in performance as the day progressed. In two tasks, simple reaction and time estimation, the effects were not significant. Digit span showed deterioration throughout the day. Results are discussed in terms of states of arousal and body temperature variations.

Blauner, R. Alienation and freedom: The factory worker and his industry. Chicago: The University of Chicago Press, 1964.

Study of the human meaning of factory work. Develops Marx's classic theory of alienation and applies it to present-day industry. Examination of the technological, economic, and social forces that determine how the worker experiences his work.

That elienation is no automatic product of modern industrial conditions is demonstrated by the author's method of comparing workers in four settings - print shop, textile mill, automobile factory, and automated chemical plant. Diverse industrial environments produce striking contrasts in the balance of alienation and freedom. This is shown by the results of questionnaires and analyses of worker's personal feelings toward their jobs.

Repecially significant is the analysis of the new forms of blue-coller work in the automated factory, based on original field research in the oil and chemical industries. The following is a summary of research results:

- I. Printing Companies (N-115): craft technology
  A. Union control over entrance to the trades
  B. High degree of control over technical envire
  C. Absence of division of labor
  D. Strong identity with occupational role
  E. Low rate of voluntary quitting
  F. Low fatigue rate
  G. High expectations of job promotion

- Textile Companies (N=400): machine-tending technology
  A. Lack of security about job
  B. Division of labor and technology causing less control of work
  C. Feelings of a "police and enforce" supervisory role
  D. Social cohesion among textile workers
  B. Non-involvement with job
  F. High fatious role

A NO. OF THE RESERVE OF THE PARTY OF THE PAR

Righ fatigue rate
Low expectation of job promotion

III. Automobile companies (#=180): assembly-line technology
A. Economic insecurity
B. Loss of control over task environment

High feelings of pressure No effect on total output - no feelings of relevance Low social cohesion

No challenge Low expectations of job promotion

IV. Chemical companies (H-78): continuous-process technology A. More job security as automation has already reduced work force B. Less worker turnover C. Jobe leed to advancement

D. Highly stratified-skill, status, job grade, pay scale, dept. and type of work Control of work environment and more freedom of movement

Less work pressure and fatigue
Small work crew responsible for quantity and quality
Technology allows freedom in task technique

Concludes that following factors enhance work: (1) Process production (2) team operation (3) job requirement of responsibility (4) physical freedom of movement (5) small group team production.

Nost workers, even though they felt their jobe did not allow them to utilize their skills all the time, felt that "this was the best place to work".

Blood, N.R. Mork values and job satisfaction. <u>Journal of Applied</u>
Psychology, 1969, 53, 456-459.

Investigated relationships of job satisfaction (JIG) life satisfaction (LIG) job description index (JDI) and agreement with protestant ethic using a sample of 448 sirmen (atudents and low skill level perconnel). Results indicated that agreement with protestant ethic was directly related to satisfaction and vice versa. Evidence is presented which indicated that job satisfaction variance controlled by work values is independent of that controlled by other variables.

Slood N.R. Intergroup comparisons of intra-personal differences: Rewards from the job. <u>Personnel Psychology</u>, 1973, <u>26</u>, 1-9.

Reports on construction of job orientation inventory (JOI) scales. Measurement instrument consists of 45 pairs of statements. Ten categories are scored for the number of times (out of nime comparisons in which it occurs) which it is chosen. Categories are achievement, responsibility, opportunity for personal growth, recognition from community and friends, job or company atatus, interpersonal relations, pay, job security, provision for family, and hobbies. Scores are self-ipsative. Reliability on one month test-retest administration ranged from .20 to .63. Scales were administered to six diverse groups (MRA students, undergraduate students, sorority girls, prison immates, prison quards, and horse track exercise boys). A discriminant function analysis indicated that the scales could discriminate these disparate groups.

Main assumption of this ipactive scale is that persons respite their work situation according to their personal hierarchy of their work rewards rather than responding to the absolute level of one dimension without regard to other rewards.

Blood, M.A., & Hulin, C.L. Alienation, environmental characteristics, and worker responses. <u>Journal of Applied Psychology</u>, 1967, <u>51</u>, 284-290.

Present position that workers from large cities could not be considered as being anomic on the basis of the evidence but could be considered to be alienated from the "work" norms of the middle class (positive affect for occupational achievement, a belief in the intrinsic value of hard work, a striving for the attainment of responsible positions, and a belief in the work-related aspects of Calvinism and the Protectant Ethic) and integrated with the norms of their own particular subculture. Simply because blue-collar workers do not share the work norms and values of the middle classes does not seen they have no norms. In the case of the middle classes does not seen they have no norms. In the case of the middle-class groups are not to suspect that workers in large industrialized cities would ashere to the dominant work value systems of the white middle-class groups. In fact, it would be somewhat surprising if these workers whose grandfathers and fathers had (likely) worked as unskilled or semiskilled laborers and had failed to rise 3bove their initial job or, even worse, had been replaced by a machine or a younger worker at age 50 would behave in the way demanded by the Protestant Ethic. Starting from this position, Blood and Mulin reanalyzed some data gathered by Patricia C. Smith. These data had been gathered from some 1,300 blue-collar workers employed in 21 plants located throughout the eastern half of the United States. Using results of Kendall's (1963) principal component analysis based on variables available in the census tracts, Blood and Hulin ordered the 21 plants located through-life (1963) principal component shich they felt would reflect the degree to which the blue-collar workers in the communities would feel alienated from middle-class work norms. Kendall (1963) labeled the principal components which were chosen for this analysis as extent of slums, urbanization, population density, standard of living, etc.

These community variates were then used to predict a number of variables obtained from each of the 21 plants. The dependent variables included extent of preparation for retirement, correlation between pay satisfaction and overall job satisfaction, etc. The predictions made were that blue-colls: workers in communities where one could expect integration with and acceptance of middle-class work norms (small community, low standard of living, few slums, etc.) would respond as the human relations theory or the striving type of motivation theory would expect. However, workers in communities where we would expect alienation from suddle-class work norms (large, industrialized communities with large slum areas, etc.) would not respond as expected and, in some cases, would respond in an opposite manner from the codinterparts in the "integrated" communities. These predictions were confirmed beyond the chance level. Of particular interest are their findings regarding job level and work satisfaction. In the most "alienated" community the correlation between job level and work satisfaction was essentiablely -.50, while among the workers drawn from the plants located in the most "integrated" community the correlation between the correlation between

Blum, A., Moore, L., & Fairey, B. The effect of motivational programs on collective bargaining. <u>Personnel Journal</u>, 1973, 52, 633-641.

Reports that while organized labor must be increasingly aware of the growing influence of such motivational forces as job enrichment and human resources development, unions have made little or no utilisation of these concepts at the bargaining table. Of 110 union contracts studied, only 8 contracts included "motivational" clauses in the bargaining agreement. Out of 12,100 clauses studied, only 11 indicated any motivational effect. It is concluded that formal acceptance of motivational concepts in collective bargaining agreements have been almost monexistent.

Blum, F. Toward a democratic work process. New York: Harper, 1953.

Explores the impact of the organized work process on the life of the worker, the attitudes it causes in him, and the values it fosters. Slum has placed himself in the role of the factory worker to discover that industrial organization prohibits creative self-expression for the worker, and to emphasize the need for more democratic values, such as self-realization. Although this study diagnoses only the conditions of one factory, it is generally informative of the problems which arise when an attempt is made to institute more democratic values into industry.

Blum, P. Mork and community. London: Routledge and Kegan Paul,

Describes and evaluates worker participation scheme in operation at Scott Bader Plastics Plant. This small firm has a most unusual structure. All the share capital was placed by the founder of the firm in a holding company. All workers in the firm can become members of this holding company and co-owners of the firm. In the first part of the book the author describes in detail the structure of the enterprise and also refers to other attempts at industrial democracy.

The book then presents philosophical discussions of man, and a new social order based on christian values.

Bockman, H. The Herzberg controversy. <u>Personnel Psychology</u>, 1971, 24, 155-189.

Presents a summary of research published from 1959-1971 relative to Herzberg's 2-factor theory of motivation. A review of Herzberg's theory and a brief summary of 46 research articles that emplore the 2-factor hypothesis are provided. Comments are made in support of Herzberg's theory in spite of the nonsupportive results estained by the research studies reviewed. The salient peints of the Herzberg controversy are emplored and discussed.

Borgstta, E.F. The work components study: A set of measures for work motivation. <u>Journal of Psychological Studies</u>, 1967, <u>15</u>, No. 1.

Reports on development and construction of measures of work motivation based on Heraberg's theory. Six scores based on factor enalysis are identified as (1) challenge of job (2) tolerance for uncertainty (3) conservative security (4) competitiveness-desireability (5) tolerance for work pressure (6) surround concern. Replication of factor structure of soores and split half correlations are reported for a subsequent large sample study (M-236). Relationship of scores to sex, verbal ability, interviewer ratings, and grade point averages reported.

Borgatts, E. F., & Ford, R. H. A note on task and situational factors in work orientation and satisfaction. <u>Journal of Psychology</u>, 1970,

Describes the theory of work motivation stemming from Herzberg with reference to studies that can involve experimentation or selection of personnel. Some variables are not subject to experimental variation, and, thus, consistency with the theory may only be inferred from group comparisons. Data are presented comparing groups of female workers in companies of the Bell Telephone System and the findings are in the expected directions, generally indicating that constrictions on the nature of the work are associated with lower tob satisfactions. with lower job satisfactions.

Borgatta, E.F., Ford, R.M., & Bohrnstedt, G.W. The work components study (WCS): A revised set of measures for work motivation. <u>Multivariate Behavioral Research</u>, 1968, 3, 403-414.

Reports on the refinement of the Work Components Study (WCS). An earlier study yielded 6 scores but the present one, with 236 undergraduates, suggests that one of them should be broken into 2, yielding 7 scores. (Personal challenge of job is broken into (1) potential for personal challenge, and (2) responsiveness to new demands). It is shown that the internal consistency of these scores is satisfactory and that the scores are relatively independent of each other. The utility of the scores is evaluated by showing their relationships with measures of personality, shill, and earlier ions relationships with measures of personality, ability, and aspirations.

There were no significant correlations of the MCS scores to scores in the area of social or emotional disorder. Importantly, there was a negative correlation between verbal ability and the MCS Conservative security score. This relationship suggests that the less able may orient themselves toward security rather than situations that will place demands on them. Finally, the negative correlations between Income supiration and MCS Conservative securit was unanticipated although it appears easy to retionalize post hoc as an aspect of "playing it safe."

Borgatta, E.F., Ford, R.W., & Bohrnstedt, G.W. Work orientation vs. hygienic orientation: A bi-polar approach to the study of work motivation. <u>Journal of Vecational Behavior</u>, 1973, <u>3</u>, 253-268.

d.

Based on the work of Herzberg's theoretical statement concerning motivation to work, a bipolar measure of work orientation vs. hygienic orientation was constructed.

The current form was a result of many approaches and revisions. The reliability and validity of the form was checked by correlating the bi-polar score with the longer multifactor Work Components Study (WCS) for five samples: Two of new industrial hires, two of seniors of a technical college, and one of male seniors from a large state university.

Using internal consistency measures, the reliability of the MCS Alternatives scores was impressive. The MCS Alternatives scores was impressive. The MCS Alternatives score was correlated with the multi-factor MCS, providing concurrent validation. In addition, discriminant and convergent validity was eachablished by correlating the bi-factor score with personality, value and shiftites measure. In each case the correlations of this ecore with these measures were low enough to show the independence of content of the bi-factor score from these measures, but high enough and in directions predicted to suggest construct validity. Finally, the predictive ability of the bi-factor score was studied by correlating it with supervisors' ratings of how long new college hires would take to reach a given level of management. While this correlation was not large (although statistically significant), the variation in both the independent and dependent variables was small enough to suggest that the correlation may have been severely attenuated.

Thus, the MCS Alternatives score appears to be a viable measure of work orientation. It is not suggested that this simplified approach to the study of work motivations should replace longer, more complex scores, such as the multifactor Mork Components Study, in every research and prediction study, since research indicates that the longer form probably is better in predicting supervisors' ratings. Sowever, it does appear that the MCS Alternatives score is a reliable and walld measure of work versus hygienic orientation.

Brayfield, A.R., & Crockett, W.H. Employee attitudes and employee performance. Psychological Bulletin, 1955, 52, 396-424.

Review of research literature on satisfaction and performance. In summary, it appears that there is little evidence in the available literature that employee attitudes of the type usually measured in morals surveys bear any simple - or, for that matter, appreciable relationship to performance on the job. With respect to withdrawal from the job, then, there is some evidence, mainly from the group design studies, of a significant but complex relationship between employee attitudes and absences. The investigations reviewed here also lend some support to the assumption that employee attitudes and employment stability are positively related. The data on eccidents and attitudes are extremely limited, but they do not support any significant relationships.

The second secon

Breer, P.E., & Locks, E.A. Task experience as a source of attitudes. Illinois: The Dorsey Press, 1965.

Reports results of seven studies of the determinants and consequences of variation in beliefs and values in the small group laboratory. Attempts to answer questions such as how ideas are formed in the first place, by they exist in one part of the world but not another, and why beliefs and values change from one generation to another. Develops a theory of attitude change involving the type of task and degree of control of task situation during the experiment. Concludes with problems of generality of the newly developed theory, and expressing the need for further research for verification.

Bregard, A., & Gulowsen, J. Norsk hydro experiment in the fer-tilizer factories. Mork Research Institute, Jan. 1968.

Reports results of a program initiated in 1966 for about 50 production workers from the Norsk Nydro Co. in Oslo, Norway. To attempt to solve the problem of increased competition and declining profits, autonomous work groups were established without supervisors A group bonus plan was installed based on productivity. Results were an increase in overall job satisfaction from 58% to 100%. Production costs per ton decreased 30% over the first six months of the project, but other factors were involved. Absenteeism dropped 3%.

Brief, A.P., & Aldag, R.J. Employee reactions to job characteristics: A constructive replication. <u>Journal of Applied Psychology</u>, 1975, 60,

Hackman and Lawler's conceptual model involving relationships between job characteristics and employee affective reactions was investigated by a partial replication. Subjects, 104 employees occupying jobs sund at rehabilitating inmates, completed a questionnaire involving their (a) perceptions of job core dimensions; (b) internal work motivation: (c) general job satisfaction: (d) job involvement; (e) higher order need strength; and (f) specific satisfactions measured by Job Description Index items. Significant positive correlations were found between job dimensions and employee reactions. While the results were in the direction of Backman and Lawler's finding the higher order need strength moderated the job characteristics - employee reaction relationship, the role of higher order need strength was found to be more complex.

Brown, J.S. How many workers enjoy discretion on the job? <u>Industrial Relations</u>, 1975, <u>14</u>, 196-202.

Using data from the census and the Dictionary of Occupational Titles classified jobs as discretionary or mondiscretionary. The basic assumption was that a job was mondiscretionary if it was coded 565 or higher discretionary if coded 454 or lower.

Results indicated that the total number of persons employed in jobs with discretion has increased from 31.7 million in 1950 to 41.2 million in 1970, but the percentage has remained the same (55% of jobs discretionary, 40% nondiscretionary, 5% unclassified). Other results indicate more blacks and females are in nondiscretionary jobs. The only age trend was that males in nondiscretionary mork have increased faster than nondiscretionary work. Roughly 35% of workers enjoy discretionary work but only 25% of the work force enjoys discretion is more than one area of work (data, people or things).

Buffa, E.S. Toward a unified concept of job design. Journal of Industrial Engineering, 1960, 11, 346-351.

Notes that "... the current, more restricted definition of job design which is taught, written about in our textbooks, and practiced in the plant is basically a motion study concept based upon improvement rather than original design."

Makes the case for integration of knowledge of environment, psychology, and physiology into Industrial Engineering practice. Views job design as two related processes, job content and job methods.

Burden, D. A participative approach and management. Shell: United Kingdom, Ltd. Unpublished Report, April 15, 1970.

Reports on a 1963 study at the Micro-Max Dept. of the Shell Stanlow Refinery, Ellesmere Fort, Chemice, England with their chemical operators. The problem was low productivity, low morals, and a possibility of a "shutdown". Operators formed group teams that provided both more flexibility within shift teams and rotation in jobs. Also, time clocks were removed. Results showed a decrease in absentesian, "output" in three sections increased by 35%, 40%, and 100% over 1985. Absence and sickness decreased from 4.3% in 1963 to 3.3% in 1969.

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Business Meek. Management itself holds the key. <u>Business Meek</u>. 1972, Sept. 9, 142-150 (a)

Reports that capital investment cannot generate productivity gains unless the workers make the most of capital support given to them. Reviews job redesign projects at TRM, General Electric, General Foods, and Hercules Chemical Co.

Reports on examples of two companies that veered out of control because management did not have a handle on what was happening. These include General Dynamics and Litton Industries. Concludes that since non-production workers account for 62 of the workforce and only about 3% of them work under any sort of productivity measurement system; to get the extra clunk of productivity in a rising cost spiral changes must be made in the overall organization setup and within specific divisions and departments.

Business Week, The spreading Lordstown syndrome. Business Week, March 4, 1972, 69-70. (b)

Journalistic report of Lordstown Syndrome in which younger workers are rebelling against production speedups, the monotony of the assembly line, and lack of freedom. Concludes that if the economy were booming, a full scale revolt of workers would occur. Reports on Initial actions taken by GN, Ford and Chrysler on the problem. GN experiments with enlarging jobs where the worker is given four functions instead of one have not been very successful. Morkers have responded favorably to experiments in giving them responsibility for deciding how to perform jobs.

Union officials see no way of changing some assembly line jobs. "The solution may be to pay workers for the unpleasantness and cut work time".

Article also reports on new Saab-Scania Engine Plant in Sweden. Seven Teams of four workers each will assemble the entire engine. The big question is whether this concept will work on high volume production runs.

Calder, B.J., 4 Straw, B.M. Interaction of intrinsic and extrinsic motivation: Some methodological notes. <u>Journal of Personality and Social Psychology</u>, 1975, <u>11</u>, 76-80. (a)

decharms has hypothesized that increasing extrinsic rewards may lead individuals to perceive their behavior as under the control of the rewards and that this, in turn, may reduce their intrinsic motivation. Recently, Deci has reported several studies dealing with this interaction between intrinsic and extrinsic motivation. A number of methodological problems with Deci's experiments are discussed. Support for decharm's hypothesis is critically reviewed in order to direct future research.

\* Calder, B.J., & Straw, B.M. Self-perception of intrinsic and extrinsic activation. <u>Journal of Personality and Social Psychology</u>, 1975, <u>11</u>, 599-605. (b)

Self-perception theory predicts that intrinsic and extrinsic motivation do not combine additively but rather interact. To test this predicted interaction, intrinsic and extrinsic motivation were both manipulated as independent variables. The results revealed a significant interaction for task satisfaction and a trend for the interaction on a behavioral measure. These results are discussed is terms of a general approach to the self-perception of motivation.

Calits, C.J., Milasel, T.M., McCormick, E.J., 6 Peters, L.H. Job characteristics, personal interests, and response disposition of incusbents as related to job satisfaction. Technical Report Mo. 8, October 1974, Purdue University, Contract Monr MO0014-67-A-0226-0016 ER 151-331, Office of Haval Research.

This study deals with the relationships between job satisfaction and the following characteristics of the job and/or the incumbent:

- Job characteristics as reflected by job dimension scores and work quality dimensions, both being based on the Position Analysis Questionnaire (PAQ).
- Job-related interests expressed by job incumbents, as measured by the Job Activity Preference Questionnaire (JAPQ).
- The "match" between an incumbent's job characteristics and his expressed job interests.
  - 4. General affect, measured by a response disposition scale

Data were obtained from 407 workers in 29 jobs in two telephone companies, with analyses also being done separately for the two companies and for the 9 management and 20 non-management jobs.

Results showed significant correlations between the predictors and both satisfaction criteria, with consistently better predictions of "work" satisfaction than total satisfaction. This is in agreement with previous studies which predicted intrinsic satisfaction better than extrinsic. Also, correlations were higher and predictions better for management jobs than for non-management jobs.

These results show support for the hypotheses that work content, personal interests, and the "match" between worker interests and job characteristics have a significant relationship with job satisfaction.

Campbell, D. T. Factors relevant to the validity of experiments in social settings. Psychological Bulletin, 1957, 54, 297-112.

In analyzing the extraneous variables which experimental designs for social settings seek to control, seven Categories have been distinguished: history, maturation, testing, instrument decay, regression, selection, and mortality. In general, the simple or main effects of these variables jeopardize the internal validity of the experiment and are adequately controlled in standard experimental dosigns. The interactive effects of these variables and of experimental arrangements affect the external validity or generalizability of experimental results. Standard experimental designs vary in their susceptibility to those interactive effects. Stress is also placed upon the differences among measuring instruments and arrangements in the extent to which they create unwented interactions. The value for social science purposes of the Posttest-Only Control Croup Design is emphasized.

Cancro, R. Automation: The second emancipation proclamation. <u>American Journal of Psychotherapy</u>, 1969, 21, 657-666.

Discusses automation's effect on the organization of society. While the economic problems of unemployment may be solved through the increased productivity that automation will bring, the psychologic consequences of not working must be met. It is essential to find adequate substitutes for the psychological benefits of working and met confine efforts colely to the economic issues.

Carlson, C. Measuring employee motivation: A study of variation in individual preferences for different job characteristics and job circumstances. Unpublished PhD dissertation, University of Minnesota, 1970.

Study of hypothesis that relative importance attached by the individual to a specified set of job characteristics will provide a useful description of his needs.

A sample of 213 precision assemblymen, quits homogeneous in their job content and descriptive characteristics, was obtained from a midwestern electronics firm.

The exploratory measure was cast as a carefully developed "Now Important?" questionnaire broadly sampling preferences for 196 different job characteristics and job circumstances. Directions were to indicate the relative importance of each job feature on a seven-point acale in terms of its perceived contribution to a "best possible job" for the individual.

Taken as a whole, the results were viewed as lending support to the general research hypothesis proposed here. The dimensional analysis indicated, however, that individual preferences were far more complex than had ween anticipated. The obtained hierarchical need structure seemed extremely useful in understanding and dealing with this complexity. Three higher-order dimensions, identified as the general needs for support (dependence on physical and social environment), advantage in environmental returns, and competence (mastery of job and environment), demonstrated a great deal of generality over individual preferences. These general needs were related to a large body of theory and seemed promising for measurement and preliminary application within industry. Many lower-wrder modes also showed a demonstrable influence on individual preferences.

Carlson, R.E. Degree of job fit as a moderator of the relationship between job performance and job satisfaction. <u>Personnel Psychology</u>, 1969, 22, 159-170.

Bypothesized that workers whose abilities were consistent with job requirements (high ability correspondence) would have job satisfaction that will have a high positive relationship with job performance, and those with low ability correspondence will have satisfaction not related with job performance. In testing this hypothesis, a sample of 506 employees who participated in the Work Adjustment Project were selected. The results supported the relationship between job satisfaction and job performance for high and low ability correspondence levels. Positive correlations were found between high ability correspondence with job satisfaction and job performance.

Carloon, R.E., Dewis, R.V., & Weiss, D.J. The effect of satisfaction on the relationship between abilities and satisfactoriness.

Occupational Psychology, 1969, 41, 39-46.

On the premise that job performance or satisfactoriness is some function of ability and motivation. 2 studies were conducted among workers. Different samples, instruments, and job requirements were used. Emp. I involved male and female assemblers: Exp. II used both male blue-cellar and mostly white-cellar is from prior test samples. Evidence is given to support the hypothesis that job satisfaction influences the ability-performance relationship.

Carpenter, J.B. Sensitivity of group job descriptions to possible inaccuracies in individual job descriptions. <u>JSAS Catalog of Selected Documents in Psychology</u>, 1974, 4, 149.

This study was designed to determine the relative impact of dichotomized task performance data compared to percent time-spent estimates for those members performing each task on the group job descriptions determined through application of the Comprehensive set of Occupational Data Analysis Programs (CODAP). Using groups identified by a routine application of the CODAP system, the percent meters performing vector was found to correlate in the mid to high 90's with the percent time spent by total group vector or group job description. These findings suggest that in groups of five or more individuals, dichotomized task performance data, which has previously been shown to have high reliability and validity, is the most critical component in the resultant group job description. Further, possible time-spent inaccuracies in individual job descriptions would not be expected to cause major charges in the group job description since its unique contribution accounts for effectively less than 10% of the total variance. These results are consistent acrose different size dyroups of varying homogeneity. This report will be of interest only to those species engaged in occupational data analyses employing the CODAP system.

Carso, R., Jr. Some effects of organization structure on group effectiveness. Administrative Science Quarterly, 1963, 7, 393-424.

Examined effects of three different organizational structures: tight (no face to face interaction), loose written and loose oral on complex problem solving (simulated sales forecasts). Subjects were male junior business majors working in groups of 7 (total H=84). Results were reported in terms of time per decision, number of written and oral interactions per decision, errors per decision, sverage costs and satisfaction with position in group. Results indicated that different structures initially emperience different degrees of performance, but eventually move toward a similar level of performance regardless of organizational structure. Loose-oral and loose-written groups had significantly lower average time per decision than tight group; loose-oral group was more satisfying to group massers.

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Cascio, W.F. Value orientation, organizational rewards and job satisfaction. Technical Report No. 82, August 10, 1973, University of Rochester, Contract Nonr MO0014-67-A-0398-0015-NR 151-351, Office of Haval Research.

The nation-wide sales force (M-540) of a large food and beverage firm responded to a survey designed to investigate the role of value orientation as a moderator of the relationship between organizational rewards and job satisfaction. From equifinality theory it was hypothesized that individuals who emphasize the intrinsic (extrinsic) aspects of work can achieve the same relative level of overall job satisfaction if intrinsic (extrinsic) organizational rewards match their value orientation. The conceptual form of the model was therefore:

J.S. - n - [ (Value Orientation-Organizational Reverds)

It was also hypothesized that those So who were high in intrincic value orientation and low in extrinsic value orientation would view satisfaction with the work itself as the most significant determinant of their overall job satisfaction. Conversely it was hypothesized that those So who were high in extrinsic value orientation and low in intrinsic value orientation would view astisfaction with work environment factors as the most significant determinant of their overall job satisfaction.

In order to put the present model into empirical perspective several alternative models of job estisfaction were applied to the same data pool. These were: the direct (Is Now) model, the multiplicative (Ismortance x Fewards) model, and the alternative discrepancy model (Importance - Rewards).

Results indicated that the normative (Survey of Work Values) instrument was most predictive of both intrinsic and extrinsic value orientation. The intrinsic subscale of this instrument correlated 0.0 with the extrinsic subscale. The two scales representing intrimsic and extrinsic organizational rewards, however, correlated .41. These results are counter to those reported earlier by Lewler and Porter (1967) and Deci (1971, 1972). A modification of the Lawler-Porter model relating performance to job satisfaction was suggested to account for the positive spillover effect due to the interaction of intrinsic and extrinsic organizational rewards.

A dorible cross-velidation procedure was employed to arrive at the best estimate of the predictive ability of each of the four models of job setisfaction. In order of predictive ability they were: "Is Now" (.55), "Importance ARewards" (.46), "Orientation-Rewards" (.40), and "Importance x Newsrds" (.32). It was suggested that each model could have utility is a specific content and within a well-defined conceptual framework. As attempt was made to relate each model to those contents in which its was would be most appropriate.

For those Se high in intrinsic value orientation and low in extrinsic value orientation, satisfaction with the work itself was not the most significant determinant of overall satisfaction. However, satisfaction with work environment factors was the most significant determinant of overall satisfaction for those Se high in entrinsic value orientation and low in intrinsic value orientation. Pisally, the high intrinsic/low extrinsic group was significantly more satisfied in terms of overall as well as job facet satisfaction across all facets then the high entrinsic/low intrinsic group. These results were discussed in terms of an expansional climate variable.

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Centers, R., & Bugental, D.E. Intrinsic and extrinsic job motivation among different segments of the working population. <u>Journal of Applied Psychology</u>, 1966, <u>50</u>, 193-197.

Interviewed a cross-section of working population (M=692) on job motivation. Besults indicated extent to which intrinsic or extrinsic job components were valued is not related to sex but is related to eccupational level (higher occupational levels-intrinsic; lower-extrinsic). Momen placed higher value on quod "co-workers" then men. Hen placed relatively higher value on opportunity to use their talent and skill.

Chadwick-Jones, J. K. Automation and behavior: A social psychological study. New York: John Wiley & Sons, Inc., 1970.

A detailed picture of the work setting, interpersonal relations, management and community structure of mill employees both before and after major changes were introduced in an English milling and tin plating operation.

The results are drawn from two separate research projects, one undertaken in 1956-1957 while the old mill was in operation, and a second begun in 1962 and continued through 1966 to assess the impact of the new automated procedures. The author makes extensive use of interview material and observation in both studies and considerable effort was expended to keep the two samples and designs as comparable as possible.

The technical automatic innovations actually made the mill hand's work easier but generated a dislike for the new mill and a longing for the old, strenuous manual procedures.

The self-selection of work teams in the old mill and the team's internal regulation of rewards and punishment, social roles and production is contrasted with the impersonal management selection in the automated works, where the employees could exercise almost no control over their work patterns or team partners. The considerable ego involvement of the manual mill's demanding work requiring skilled judgement and manual dexterity generated not only a positive self-image and job satisfaction, but also high production quality. The detached indirect observation of the automated operation, however, leaves the workers out of things, unimportant, and more concerned with getting through the shift than getting out quality work.

Community structure and expectation appear as surprisingly strong determiners of job satisfaction. In fact community norms about the value of hard work and the scheduling of worship and recreation generate much of the dissatisfaction with work in the automated plant. The author makes a strong case for the necessity of studying such norm and coming to gripe with them through an educational process prior to the introduction of major technological change.

One of the most interesting conclusions that Chedwick-Jones draws in the extent to which management style as well as worker behavior is tied to both technological design of the plant and the social structure of the community.

Champoux, J.E. Individual reactions to work: The compensatory and spillover models re-examined. Technical Report No. 32, January 1975, University of California, Contract Monr M00014-69-A-0200-9001-EB 151-315, Office of Naval Research. (a)

A sample of 178 individuals were asked to describe their work experiences, nomwork experiences, and their self-concept using the same set of 25 semantic differential scales. Comparisons of these descriptions permitted each individual to be classified into one of the following four types: Spillover - Mork-oriented, Spillover - Mork-oriented, Spillover - Mork-oriented, Compensatory - Mork-oriented, and Compensatory - Monwork-oriented. Analysis of the content of the descriptions revealed that spillover individuals of both types viewed their work and nonwork emperiences in approximately equal ways. Compensatory individuals, however, showed sharp contrasts. Those who were work-oriented viewed their work experiences as more positive than their nonwork emperiences. Those who were nonwork-oriented viewed their work experiences as less positive than their nonwork emperiences. Thus who were nonwork-oriented viewed their work experiences as less positive than their nonwork emperiences. Furthermore, compensatory individuals viewed themselves as less deliberate, orderly, active, and chellenging than spillover individuals. The theoretical implications of these results are discussed.

Champoux, J.E. Work and nonwork: A review of theory and empirical research. Technical Report No. 31, January 1975, University of California, Contract Non: NO0014-69-A-0200-9001-NR 151-315, Office of Mayel Research. (b)

Theoretical and empirical literature dealing with various aspects of the relationship between work and moment are reviewed. An assessment is made of where we stand in our accumulated theoretical and empirical knowledge. Suggestions for directions of future research are gives.

Changy, F.B. Employee participation in manufacturing job design.

Buman Factors. 1969, 11, 101-106.

Determined the effect of employee participation in job design activities in a computer ranufacturing company. Nine supervisors completed a training program on participative management. Each supervisor conducted a series of meetings with a group of his employees. The level of group participation was observed and rated independently by two staff psychologists. Six groups and a matched control group (total 3-86) were evaluated in terms of output (number of parts produced per hr. and wt.), employee attitude (a questionnaire was developed which measured job attitude toward problem solving, production goals, methods and instruction, tools and equipment, recognition and achievement), and level of participation.

The percentage of favorable job attitudes and the amount of performance improvement were both positively related to the level of group perticipation. Output was increased 45% and 90% respectively in medium and high levels of employee participation. The control group and low participation groups failed to show improvement. The specific job changes which resulted from this process included modification of hand tools, and work stations. The relative contribution of tachnical improvements and group participation to improve production is not specified or detailed.

Chaney, F.E., & Teel, K.S. Improving inspector performance through training and visual side. <u>Journal of Applied Psychology</u>, 1967, <u>51</u>, 311-315.

As experimental study was performed to evaluate, eingly and in combination, the effectiveness of a 4-hr. training program and a set of visual sids designed to improve the performance of 27 experienced machine-perts inspectors. The criterion used was the percentage of true defects detected in a selected sample of machine parts. Findings indicated that (a) use of training alone resulted in a 32% increase in defects detected, (b) use of visual sids alone resulted in a 42% increase, and (c) use of both resulted in a 71% increase, while (d) performance of the control group did not change.

Chapanis, A. Knowledge of performance as an incentive in repetitive monotonous tasks. <u>Journal of Applied Psychology</u>, 1904, 48, 261-267.

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This experiment tried to isolate the purely motivational affact of knowledge of performance from its informational and rewarding aspects. The subjects (Ss) worked an hour a day, for 24 days, punching random digits into a teletype tape. They were told they were programming a computer and efforts were made to lend credibility to this fiction. 16 male undergraduate students were assigned to 1 of 4 groups. Ss in 1 group received no information about their output. In 2 other groups, the Ss could see a counter which tallied every stroke on the perforator and could, if they so chose, determine their daily work output. In the 4th group Ss were required to write down their output at the end of 15, 30, and 45 minutes, for accounting purposes only. Mo significant differences were discovered among the 4 groups. Suggestions are offered to account for the discrepancy between the results of this experiment and those of a similar experiment reported by Gibbs and Brown in 1955.

Charnes, A., Cooper, W.W., Miehaus, R.J., & Stedry, A. Static and dynamic assignment models with multiple objectives and some remarks on organization design. Hanagement Science, 1969, 15, 365-375.

The assignment model of linear programming is here extended to allow for vector optimizations and dynamic interactions between assigned personnel and positions in each of which a variety of possible measures and approaches are explored. Formulations involving people-to-people as well as people-to-position matchings are also examined from the standpoint of organizations in which jobs may be fitted to people or vice verse as well as in weighted combinations. Possible uses of such models for dealing with the problems of placing disadvantaged or handicapped persons are noted, but the analysis stops short of the still further possibilities offered by new types of machine-technology and information systems designs.

Chase, R. B. Strategic considerations in assembly line selection. Salifornia Hanagement Review, 1975, 18 (1), 17-22.

Pollowing guildelines are suggested in selecting and using assembly lines. The all-too-common notion that assembly lines cannot be humanized should be dispelled, and management can end should play a role in some of the technical decisions. The guidelines and discussion presented here should be of use to executives who are in the process of evaluating the performance of an existing line.

 Consider the evaluation of specific charactersities of assembly lines as alternatives of equal importance to the line-versus-no-line decision.

- Avoid rigid pacing of lines. This can be done by permitting removal of items from the line or by provision of on-line inventories or banks.
- 3. Use short lines (less than ten people) if at all possible.
- Avoid mixed-product lines. Several single-product lines are generally easier to manage then one mixed-product line. Task variety, though typically greater on mixed-product lines, can be achieved by worker rotation.
- 5. Consider group control of lines, with short lines especially, permitting the workers at each line to determine who will do what tasks and to specify at what speeds the line will operate at different times in the day can humanize the work without decreasing production. (The role of menagement in such cases is to provide the necessary support resources and to specify the daily output requirement.)
- Invest some resources in developing good selection procedures for line workers. Some people like repetitive work and efforts should be directed at finding such individuals.
- 7. Pass up the opportunity for your company to become a leader in developing new assembly-line balancing methods. The assembly-line balancing problem holds a fascination for industrial engineers and computer programmers. A complex line is often an invitation to them to experiment with their craft.
- 8. Bring together personnel and engineering specialists in deciding upon line characteristics. It is rare to find personnel staffs who understand the technical problems of line operation and engineering personnel who understand the behavioral implications of various line alternatives. (An effective management mechanism to assure that interaction occurs is to set up a project team that includes representatives from each discipline.)

Cherns, A. Perspectives on the quality of working life. Journal of Occupational Psychology, 1975, 48, 155-167.

Reviews basic assumptions of the quality of working life which include (1) organization has a technical system, (2) technical system sets parameters for the operation of its social system (2) social system is partly task based, (4) social system is in part in service of preserving the integrity of the system, (5) the objectives of any organization allow a choice system, (5) the objectives of any organization allow a choice samong technologies, and (6) needs of workers need to be satisfied in their work. Associated with these assumptions are certain values of autonomy, high skill level, training and a high degree of self investment in work which offers opportunities for growth and self realization.

Examines following four criticisms of the quality of work life movement: (1) efficiency and productivity of an organisation are paramount, (2) joint optimization ignores and underplays basic conflicts in organizations, (3) by constructing organizations which blur differences between workers and management the class struggle is hindered by distracting attention from the real issues, weakening trade unions and "co-opting" workers onto mechanisms for attaining management quals and (4) it is wrong to make people put too much of themselves into work because without guaranteed tenure there is too much risk. Mork is less necessary for society and the worker is alienated by the capitalistic mode of productions.

The growth and diffusion of the quality of work life movement on the international scene is considered.

Cherrington, D.J. The effects of a central incentive-motivational state on measures of job satisfaction. Organizational Behavior and Euman Performance, 1973, 10, 271-289.

A central incentive-motivational state has been proposed as an internal construct which becomes conditioned to incentive-motivational stiguil in a work environment and influences a wide variety of responses, including self-report measures of satisfaction. Using three financial reward manipulations, 135 undergraduates performed a simple reportitive task and were either, (a) rewarded, (b) nonrewarded, or (c) their rewards were unknown at the time they were asked to complete a set of semantic differential scales. Rewarded Ss reported not only greater satisfaction with pay and general affective tons than nonrewarded Ss, but also reported greater satisfaction with fellow workers, the supervisor, and the task. The postulate that a central incentive-motivational state can be conditioned by an organisational reinforcer and subsequently influence attitudes regarding various other organizational etimuli was generally substantiated, especially for attentive-specially distributions of the second state of the second secon

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Cherrington, D.J., Reits, H.J., & Scott, M.E.Jr. Effects of contingent and non-contingent reward on the relationship between satisfaction and task performance. <u>Journal of Applied Psychology</u>, 1971, 55, 531-536.

It was proposed that there is no inherent relationship between satisfaction and productivity, and that relationships between the two variables are highly dependent upon performance-revard contingencies. Ninety Ss performed a task for 1 hour. A menetary reward was then delivered to 21 of 42 high performers and 21 of 42 low performers. The Ss next completed self-report measures of satisfaction and attitudes and performed the same task for another hour. Correlations between self-reports of satisfaction and second-hour productivity over all Ss was .00. Significant positive correlations, however, were found between satisfaction and productivity of appropriately reinforced &s (rewarded high performers and nonrewarded low performers) while significant negative correlations were found for inappropriately reinforced Ss (rewarded low performers and nonrewarded high performers).

Christensen, J.M., & Mills, R.G. What does the operator do in complex systems? <u>Buman Factors</u>, 1967, 9, 329-340.

Reviewed 31 complex operator's jobs in the military aircraft and manigation field. Little usable data had been obtained on these activities unler operational or field conditions. Activity data from tests, simulations and paper and pencil measures were used. A tax-onomy was employed to classify activity data. This taxonomy includes four processes with further breakdowns into activities and specific behaviors. The four processes are perceptual, mediational, communication, and motor processes. The two authors independently used this taxonomy to classify the activities of nine of the 31 operators. Rank order correlations between the authors ranged from +.29 to +1.00 with a median of +.78. Peter reliability could be increased by clearer definitions of job activities, use of a standard taxonomy, and rater familiarity with jobs.

It was generally concluded that where activity data have been gathered under operational conditions, they have been useful to design engineers, human factors specialists and systems analysts. It is further noted, however, that additional effort must be devoted to the development of hetter methods for obtaining data and corresponding criteria of human performance under operational conditions. A discussion of the taxonomy and other techniques indicated that collection of activity data should be feasible under operational conditions. In addition it is suggested that increased standardization and use of operational definition in the development of these techniques might result in improvement of their general applicability.

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Clark, W.H. Relationships of motivational orientations to personality characteristics. <u>Experimental Publication System</u>, 1970, §, Ms. Fo. 201A.

Study of 271 elementary and secondary public school administrators, relating motivation as measured by Herzberg's c.itical incident technique and a job motivation inventory to personality (CPI).

Study replicated and confirmed motivation-hygiene theory. Factor analysis indicated that personality characteristics associated with growth, ascendancy, a capacity for flexibility and independent thought were positively related to the degree of motivator orientation. Bygiene orientation was related to conformity, rigidity and passivity.

Coburn, D. Job-worker incongruence: Consequences for health. Journal of Realth and Social Behavior, 1975, 16, 198-212.

This paper examines the consequences for a man's health of work which is perceived as excessively complex or excessively simple (job incongruence). Among a group of Canadian working man (Me80 man), excessively complex work is not disliked but is associated with lower mental and physical health. In addition to being disliked, overly simple work shows similar psychological but much less evident physical effects. The influence of job incongruence on physical health is most noticable for men who feel their work is much too complex for them to handle adequately. Pridence suggests that perceived incongruence has much larger effects on health than does objective incongruence.

Coch, L., & French, J. R. P., Jr. Overcoming resistance to change. Human Relations, 1948, 1, 512-532.

Study at Harwood Manufacturing Corporation regarding employees' resistance to change in work methods or jobs. Plant employed 500 women and 100 men who worked on an individual piece rate incentive system.

An analysis of relearning curves of experienced operators showed that approximately 40% recovered within 8 weeks, and approximately 60% either became chronically substandard operators or quit during the relearning period. This relearning period for the experienced operator was longer than the learning period for a new worker. It was concluded that resistance to change and slow learning was primarily a motivational, rather than a skill, problem. In addition, workers adhered to a management quota and group standards of production.

In a series of experiments, it was found that worker participation in production and job changes decreased resistance. It was found that the rates of turnover and aggression were inversely proportional to the amount of participation. Total participation of the work force was more effective than participation through representation.

Cohen, G.B. The task-tuned organization of groups. Ameterdam: Swets & Zeitlinger, 1969.

Formulates hypotheses about the relationship of organization and task structure in effective group problem solving. The theoretical formulation involves concepts of interdependence, coordination and centrality. The book describes experimental studies testing these concepts. The book is relevant to small group behavior, the organisation theorist and the practitioner who works with problem-solving groups.

Conant, E.H., & Kilbridge, M.D. An interdisciplinary analysis of job enlargement: Technology, costs and behavioral implications. Industrial and Labor Relations Review, 1965, 18, 377-395.

Report of job enlargement program of midwestern manufacture of home laundry equipment from 1959-63. The company established 14 bench assembly jobs and 50 bench positions. These jobs previously were performed on conventional progressive assembly lines. Enlarged bench jobs in comparison to line jobs involved 2 to 3 times longer job time cycles, increase of approximately 3 times as many work elements, improved quality, efficiency, and longer training time. Enlarged bench shop design reduced non-productive balance delay time resulting in a slight cost saving and improved quality. Social interaction was reduced in enlarged work stations. Morkers expressed preference for job enlargement 2 to 1. Personal characteristics of the worker wore not associated with work preferences as the sample was homogeneous. Morkers' attitude was most favorable to specifics of self pacing and quality contribution of bench work. Morkers attitude toward line work was not as negative as previously reported in the literature.

Cooper, B. Man, task and technology: Three variables in search of a future. Human Relations, 1972, 25, 131-157.

Theoretical review of future of industrial production technology. Bext stage of development lies in area of information processing and computer control of production. Presents a framework for study of man-technology relationship. Concludes that the increased complexity of advanced automation calls for complex and more specialized maintenance skills. This will provide the opportunity to design polyvalent jobs so that operation personnel are enabled to sesume maintenance responsibilities. Points out that task content is not shaped entirely by technology but by the organizational environment.

Cooper, R. Task characteristics and intrinsic motivation. <u>Human Relations</u>, 1973, 26, 387-413.

Presents a framework for the study of intrinsic task characteristics, particularly with reference to motivational implication. Four intrinsic dimensions of tasks are isolated; physical variety, skill variety, goal structure, and transformations. Dimensions were derived from statistical and conceptual analyses of existing research on task characteristics. Evidence of laboratory and industrial investigations suggests that the separate dimensions affect performance and job satisfaction in different ways. Individuals differ in their desire for intrinsic interest in work and the difference sexert important moderating effects on the relationship between the four task dimensions and the dependent variables of job behavior (performance, satisfaction, absenteeism, and labor turnover). The relevance of task dimensions to other areas of study of motivational and organizational behavior is discussed.

Cooper, R., & Foster, M. Sociotechnical systems. American Psychologist, 1971, 25, 467-474.

Theoretical review of theory developed at Tavistock Institute of Ruman Felations. The concept of a sociotechnical system is that a production system requires technology and work-relationship structure that relates human operators to technology and to each other. Technology makes demands and places limits on the type of work structure possible, while work structure itself has social and psychological properties that generate unique task requirements. The article reviews man machine relationship. Hen perform optimally when they can control environmental contingencies, resonabilities are specified and when they are motivated. Motivation must derive from the task itself and tasks must represent a challenge to the human operator. Most important dimensions of work structure are role differentiation (task variety) task dependence and goal dependence. Reviews theory in terms of effects of technology change in British coal mines and Indian textile mills. Concludes that new value systems of individual autonomy and expression is emerging which requires sociotechnical thinking for viable manmachine systems and organizational structure around the work itself.

Cooper, R., and Payne, R. Extraversion and some aspects of work behavior. <u>Personnel Psychology</u>, 1967, 45-57.

Study of 113 female operators from a packing department of a bacco factory where the work was light, repetitive, and mainly whine paced. Controlling for the effects of neuroticiam and age, troversion was related to work withdrawal (the more extroverted kers had shorter tenure and more non-permitted absences). It also found that more extraverted workers tended to leave the

company.

Discusses three theories to account for results:

1. Inhibition hypotheses: extroverts are less able to
tolerate routine tasks.

2. Condition ability hypothesis: extroverts condition slower
and are less likely to be influenced by social and institutional
codes of behavior and therefore are absent more.

1. Arousal hypothesis: extroverts have a low arousal level
and require more environmental stimulation.

Corlott, E.N. Human factors in the design of manufacturing eystems. Human Factors, 1973, 15 (2), 105-110.

The contributions which human factors studies can make to industry are discussed in this paper. Broadly, contributions can be made in two areas, product design and the design and use of manufacturing equipment. The latter area is the major concern of this paper and some of the work done on ordinary manufacturing equipment is described. A major problem is the validation of human factors recommedations and it is pointed out here that the normal short-term evaluation is inadequate. For the effective use of people in industry it is necessary for human factors personnel to take a wider view of their contributions than has been common in the past and to consider their role in relation to the long-term operation of the whole plant and consider the three separate dimensions listed below.

_	Activity	Function Subsystem
1.	Information manipulation	Sensing, transmitting, storing, perceiving transforming, dis- eriminating
2.	Energy transformation	Metabolic processes, movement and force generation, control of levels and rates of output (i.e., physiological aspects of 1)

3. Ongoing goal-directed behavior

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Satisfying curiosity, need for interest, authority, society, leading, following other grouping needs

Cotgrove, S., Dunhan, J., & Vamplew, C. The nylon spinners: A case study in productivity and job enlargement. London: Allen & Unwin, 1971.

Detailed examination of a case study in productivity bargaining and job enlargement by a research team from Bath University at a Subsidiary of Imperial Chemical Industries. Morkers initially were concerned by lower level needs (increase in pay). The agreement led to improved motivation and performance and reduction in labor turnover, fatigue and horedom. Authors conclude that despite years of work with little responsibility, latent needs for self-actualisation emerged when there were opportunities for their satisfaction. Morker passivity and irresponsibility were the result of past management policies which denied men intrinsic rewards and led them to expect extrinsic ones such as good wages.

Cox, D. Organization of repetitive tasks: Some shop floor experiments recalled. Occupational Psychology, 1970, 44, 81-88.

Examined postwar research on the organization of repetitive tasks in two areas: breakdown of tasks and batch size. After a few direct experiments on job breakdown and batch size and attempts to measure rate of working did not reveal significant results, a subjective method of interviewing operators to obtain their reaction to repetitive work was employed. Job studies, with particular attention to factors which sight be related to monotony, were also studied. Results show that different people like different types of work. A suggested distinction between work and enjoyment is that the former involves constraint, and the more rigid the work situation, the greater the constraint. Findings also show that the most preferred jobs are well organized and call for one's full attention or none at all. Variation in working rate was discussed in relation to the other findings.

Cox, D., & Sharp, K.M.D. Research on the unit of work, Occupation Psychology, 1951, April, 90-108.

Report of work done from 1948-1958 in research appeared by Euman Factors Pamel of Committee on Industrial Productivity. Be search consisted of field studies of the effect of work cycle as batch size on output, absenteeism, turnover and subjective at-titude criteria.

Pellowing recommendations on batch size are likely to be effective on work on small objects and simple tasks with a 30 second or less unit work cycle;

(1) Where material is now issued in a batch lasting for half a day, we would suggest cutting it to batches lasting I to 1 1/2 hours, provided that the collection of smaller batches does not involve under sates work.

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(2) It has been our experience that small batches are most appreciated by learners and people working at time rates. Piece-rate workers seem to be unaffected by batch size. A development may suggest itself here: the issue of reduced batches to learners, of, say, half the normal size. Transfer to full-sized batches could mark a stage in attaining proficiency, and might act as a target in learning.

The following observations relate to unit work cycle:

- (1) A major problem, admitted by most production engineers, is that of obtaining balance between operators in a production line. Here it is suggested that reasonably long unit work cycles are desirable, eince they allow more scope in adjusting the margin between one operator and the next. We refer here to the balancing of operations as such, and not to variations introduced by individual differences of operators.
- (2) Where operators work singly, they can vary their rate of working from minute to minute without holding up anyone else. In a flow line this is not possible unless some allowance is made for a small stock of semi-finished material between operators. Since operators do, in fact, work at rates which vary throughout the day, provision should be made for such stocks.
- (3) Our findings suggest that beginners have no particular preference for a long unit work cycle, and, in fact, that for a considerable period they may prefer a short cycle; but when they have fully mastered the task at that level, they may benefit from the stimulus of learn-ing to do a more complex task. But all workers are thus affected; we would contained by suggest a transfer to a longer unit cycle on the same or similar work for those people who seem to be losing interest although their ability is adequate.

Parther work is indicated in two directions:

- (1) To widen the coverage of tasks
- (2) To increase the range of batch sizes. Work done in this research has concerned the reduction of 'tch size from those occupying 3 hours to those occupying 1 hour.

Buffer Stocks

Findings of this research indicate the need for work on buffer stocks to allow short-term variations in working rate as between one operator and another in flow lines. The method could follow that planned for unit work cycle experiments, comparing the position on the same line before and after allowing for buffer stocks between operators.

In particular, two points suggest themselves:

- Comparison of individual workers each making a whole article with a team having the same total task split up among them into small sub-toaks.
- (2) Observation of groups allowed to arrange their own division of the task.

Cosen, L.W. Job enlargement and employee satisfaction. <u>Personnel</u> Journal, 1959, 18, 95-96.

Considers question if breaking jobs down into fragments im-proves the quality and quantity of production? And what does such fragmentation do to the worker? Discusses multiple manage-ment cystoms using the employee representative heards and the Scanlon Plan which encourages active employee participation in cost reduction and suspected programs. Cises examples to suggest that both the preduction workers and the white-collar group may work with better spirit and contribute more to exampny progress when their jobs are so enlarged as to challenge them and elicit their thoughtful interest.

Crosier, M. The world of the office worker. Chicago: The Univ-ereity of Chicago Press, 1965.

Contribution to understanding of European white-collar worker. In Part One of his work, Rr. Crosier defines the french white-collar worker and puts him in societal perspective. He recounts the history of civil service and other white-collar unionies, and depicts the relationships between office workers, their unions, and their union activists. He then reviews significant European and American sociological literature dealing with the office worker, thus providing rich background material for the sociologists while pointing out how the evolution of this sector of the working class has differed from or borne out earlier predictions.

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Parts Two and Three deal more specifically with the amployees of six Partsian insurance companies where the author carried out extensive interviewing in 1957. Mr. Crozier discusses here the interviewed population and his research procedures, the employees' adaptation to their workplaces, interpersonal relations among employees, their participation in and integration into their organisations, social status, and cultural level.

A problem to which the author consistently addresses himself throughout the treatise is the lack of class consciousness in the white-collar middle level sector. Me takes issue with Marxists and asserts that the lack of collective identity seems to allow more individual freedom for the office worker, concluding that "the social game played by the white-collar employee of today is - at least when qualifications are held equal - much richer and more numerod than that of yesteryear."

Mr. Crozier believes that alienation is not on the increase. "On the contrary," he writes, "it really seems that this alienation in the mass media, or in the bureaucratic relations denounced by those who despise modern society, is in the end no more than the necessary counterpart of the accelerated increase in participation. The multiplicity of possible alienations, and the incoherence which naturally emerges as a result, tend to liberate the individual. The more the choices offered him allow him a divergity of combinations, the more easily he can escape the determinism of his group, of his condition and even his society."

Cummings, L.L., & Schwab, D.P. Evaluation of theories linking employee satisfaction and performance. <u>Proceedings 78th Annual Convention APA</u>, 1970, 581-582.

Theoretical comments on satisfaction-performance linkage. Theoretical problems include need for specification of multiple satisfaction components, operational definitions and measurements of performance and investigation of importance of moderator variables (e.g. ability). Puture research should be devoted to establishing longitudinal relationships using cross-lagged models and commun neasures so that satisfaction-performance relations can be examined across a variety of work situations.

Cunningham, J.W., Tuttle, T.C., Ployd, J.R., & Bates, J.A. The development of the occupational analysis inventory: An exquestric approach to an educational problem, <u>JSAS Catalog of Selected Documents in Psychology</u>, 1974, §, 144.

The development of an Occupation Analysis Inventory (OAI) containing 622 york elements (descriptions of different kinds of work activities and conditions) applicable to the general population of jobs and occupations is described. The OAI is conceived as the first step in the development of a work taxonomy applicable to occupationally related education and guidance. The OAI work elements, generated within an information-processing framwork, have been weighted in terms of their requirements for selected human attributes in the cognitive, psychomotor, and affective domains. Thus, the OAI can describe jobs and occupations in two ways: (a) in terms of various kinds of work activities and conditions and (b) in terms of estimated requirements for defined human attributes for which there are tests. Immediate research plans call for the derivation and validation of basic work dimensions (factors) and attribute-requirement estimates through application of the OAI to a representative aspels of occupations, and the subsequent derivation of an occupational cluster structure based on the OAI variables. Potential areas of application for an OAI-based taxonomy include curriculum analysis and development, occupationally-related test development, curriculum evaluation, occupational guidance and placement, and educational planning. Long range research and development possibilities are discreased. A copy of the OAI is included in the appendix of the repeat.

achier, H.P., & Hulin, C.L. A reconsideration of the relationship between satisfaction and judged importance of environmental and job characteristics. Organisational Schavior and Human Performance, 1969, 4, 252-266.

1969, 4, 252-266.

Examined F. Friedlander's results and the conclusion that his date represented support for the two-factor theory of job satisfaction (F. Merzherg). 442 male and female white-coliar workers employed by the same company and living in a company town in Canada were asked to indicate their satisfaction and judge the importance of 21 environmental and job characteristics. Satisfaction with 18 of the characteristics was measured by a 3-point Likert scale. Canadative point adjective check lists were used to measure satisfaction with the remaining 5 characteristics. The importance of all characteristics was assessed on a 5-point Likert scale. Results indicate that for all environmental or job characteristicm a V-manped function between satisfaction and importance were assessed by Likert scales. No V-maped relationship was found when satisfaction was measured by cumulative point adjective check lists. It is concluded that Priedlander's results depend on the measurement scale used, and thus are hasically artifactual. His results therefore cannot be interpreted as giving support for the two-factor theory of job satisfaction.

Belton, G.W., Barnes, L.B., & Zaleznick, A. The distribution of sutherity in formal organizations. Boston: Marvard Business School, Bivision of Research, 1968.

Investigated effects of increasing the responsibilities of lower level members of a research and development laboratory division of a large industrial corporation. Using an in-depth case history approach they were able to obtain pre and post change measures from the involved group and from a control group who were not involved in the change.

The data consists of organization records, interview protocols, and responses to questionnaires. As far as averall organizational functioning is concerned, the changes in suthority produced mixed results. Generally, increases in responsibility and authority led to greater motivation to produce, greater job satisfaction, and higher perceived productivity. This finding was more consistent for those whose authority was professionally based, i.e., senior and junior scientists, engineers, etc., than for those whose authority was positionally based – junior and senior managers. It was demonstrated that dissatisfactions resulted from felt losses in authority as well as from unfulfilled expectations of increased authority and efficiency. The finding about the effect of unfulfilled expectations was possible because of the authors' use of the comparison groups.

Dalton, G.W., Lewrence, P.R., & Lorsch, J.W.. <u>Organizational structure and design</u>. Homewood, Illinois: The Dorsey Press, 1970.

Concentrates on problems of building or adapting organizations to perform new tasks or to meet new challenges. Readings center on the problems of obtaining a "fir" between an organization and the tasks it performs.

Davies, D.R. Monotony and work. Science Journal, 1970, 6, 26-31.

Surveyed work experiments to study the effects of certain variables which tend to hamper efficiency. Differences in temperament greatly alter the amount of errors found in inspection tasks. It is noted that often in assembly line type situations, individual differences between workers is wrongly minimized. The effects of knowledge (KR) were also studied. One explanation suggests that KR builds up a set of expectancies. A second theory proposed that KR acted as an incentive which notivated the 5 to pay closer attention to the task. IR was shown to affect the level of arousal. The effects of rest were also discussed. It is concluded that the single variable which bears the greatest relation to deterioration in efficiency in vigilance tasks is temperament.

Davies, D. R., Shackleton, V. J., & Leng, L. The effects of complexity and uncertainty upon performance at a problem-solving task. Psychonomic Science, 1972, 27, 193-194.

Investigated the effects of order of presentation of task complexity on problem solving efficiency and attitude toward the task, (Group 1 - increasing complexity; Group 2 - decreasing complexity; Group 3 - random order of complexity). Results indicated significantly feeter solution times for Group 1 and a ron-significant trend for Group 3 to have lower boredom accree. Results interpreted as providing some support for beneficial effects of uncertainty upon task efficiency and involvement.

Davis, L.E. Job design and productivity: A new approach. Personnel, 1957, 11. 416-430.

Specialization and job design are discussed as well as current approaches to job design, job design on the assembly line, and the problem of redesigning jobs.

Davis, L.E. The design of jobe. <u>Industrial Relations</u>. 1966, §. 21-45.

Review of job design studies in industry involving machine operators, assembly line workers, maintenance task workers, and supervisors. Studies lend support to responsible autonomous job behavior as a key facet of individual-organization technological relationships. Improved performance was a function of job content (cleaure, variety, self inspection) job environment (social interaction and communication with poers and supervisors), and supportive management behavior.

Davis, L.E. Restructuring jobs for social goals. Manpower, 1970, 2, 2-6.

Examination of policy decisions for job restructuring. Three categories (autonomy, adaption and variety) are designated as essential job requirements. Relevant policy questions discussed include job definitions and boundaries in union contracts, committeent to worker's career development, quality of work life, and definition of social objectives with respect to the organization, individual and society.

Davis, L.E. Job satisfaction research: The post industrial view. Industrial Relations, 1971, 10, 176-193.

Contracts values, organizational philosophies and ecological strategies of industrial and post-industrial eras. Job satisfaction research in the industrial era concentrated on extrinsic variables and completely disregarded job content variables. New post industrial era led to the development of a conceptual framework known as socio-technical systems which concentrates on interactions among society, its organizations, technology and the individual. Future job satisfaction etudies should focus on autonomous job behavior and consider the following topics: forms and means of goal setting, multiple goal satisfaction, individual and organization adaptibility, self-sufficient operational autonomy, feedback and rewards. The new method will be action research process (practice—) theory—research to test theory—isproved practice.

Davis, L.E., & Canter, R.R. Job design. <u>Journal of Industrial</u> Engineering, 1955, 6, 1-6.

Discusses development of job design theory and the need for systematic studies of job design methods. The concept of job design methods. The concept of job design may defined, and consideration was given to the need for principles of job design, the criterion problem, and a brief review of primary sporoaches to job design and their limitations. The job-centered approach is suspetted as a basis for the development of a job design theory and research thereon, and the economic productivity criteriom (minimising total cost) is advanced as a very to evaluate various possible designs.

Davis, L.E., 6 Canter, R.R. Job design research. Journal of Industrial Engineering, 1956, 7, 275-282.

Complete report on Marks (1954) controlled job enrichment project involving line job design, group job design and individual job design in Manufacturing Co. Project involved 29 female assemblers. Results indicated improved quality, lower production group vs. line design.

Also reports on Indian textile mill job design project and reorganization of worker groups (Rice, 1953, 1958).

Davis, L.E., Cherns, A.S., & Associates (Editors). The guality of working life: Problems prospects and the state of the art. (Volume 1) New York: The Free Press, 1975.(a)

Book emerged from an International Conference on Ouslity of Morking Life convened on September 25-59, 1972, at Arden House, Barriman, Bew York. Book contains 16 original articles and accompanying commentary assessing the quality of working life. Articles center on definition, evaluation and measurement of quality of work life, enhancing quality of work life, relationship of union movement to quality of work life, effects of technology and other related topics.

Davis, L.E., Cherne, A.B., & Associates (Editors). The quality of working life; Cases and quementary. (Volume II) New York: The Free Press, 1975(b).

The collection of cases in this volume was proposed by the Planning Committee for the International Conference on Quality of Morking Life, 1972.

The four cases, two from Sweden and two from the United States, reflect national differences—the Swedes believing that cooperative errangements can solve the most deeply rooted problems and the Americans tending to split between adjusting people (by training, in this case) to meet the needs of organizations or society and "doing one's own thing," that is, emphasizing individualism even in bureaucratic organizations.

Selection 2, "Status of the Case as Science," deals with the need for and uses of the case study. These factors and experience of the realities of bringing about organizational change, a process discussed in selection 3, "Action Research," point out that it is not possible to change organizations by means of experiments or to experiment with the process of organizational change in real time. In view of what has been learned and what is required to continue our learning about enhancing the quality of working life, a task force on "comparability" was created to make recommendations to the International Conference on Quality of Morking Life, September 1972. Their report and that of the task force on avauation are contained in selections 4 and 5.

The cases deal with the most difficult aspect of enhancing life in the work-place, improving characteristics of organisations, jobe, and work roles intrinsic to work itself.

The cases provide very considerable ineights into the processes and consequences of a variety of changes undertaken to enhance aspects of organization and jobs that improve the quality of working life. Many are viewed as successful by the authors, others as unsuccessful. Beedless to say, there are no egreed standards of success or failure.

The second half of the book reviews job design projects by using the case study method.

Davis, L.E., & Taylor, J.C. (Eds.) Design of jobs. Baltimore: Penguin Books Inc., 1973.

Consists of 28 readings that center on theme that job design movement should involve the whole socio-technical system. Section 1 presents a history with the evolution of job demands in industrial society. Section 2 deals with the current condition which stresses minimizing the time to finish a job. Section 3 discusses recent theoretical trends including articles by Herzberg. Hackman, and Lawler. Section 4 involves job design cost criteria. Section 5 reports on job-centered studies in the United Kingdom and at the Maytag Co. Section 6 deals with work systems study in Morwey, and U.S. This study concludes that a general model of responsible autonomus job behavior is needed for individuals. The future of job design (Section 7) indicates that four conditions are necessary for effective job performance. These are responsible autonomy, adaptibility, veriety and participation.

Davis, L.E., & Trist, P. Improving the quality of work life: Experience of the socio-technical approach. University of Pennsylvania, Management and Behavioral Science Center, 1972.

Studies humanization of work in the Philips Electrical Industries in Holland in 1960, using 240-300 assembly workers. Independent work groups were formed and made responsible for job allocations, material and quality control, and providing delenates for management talks. Results showed the members of semi-autonomous groups derived more satisfaction from their work compared with workers in the old situation. By 1967, waste and repairs decreased by 48 and there was an unspecified cost savings in lower managerial personnel.

Davis, L.E., & Valfer, E.S. Intervening responses to changes in supervisor job designs. <u>Occupational Psychology</u>, 1965, <u>19</u>, 171-189.

This study was conducted at a large military installution amploying 5900. Supervisory jobs were redesigned to (1) enlarge their responsibility for product completion or (2) to enlarge their authority to include inspection of quality. Four conclusions were determined:

- Performance improved when it was supported by the organisational environment.
- Supervisors exhibited greater degrees of autonomy and need satisfaction due to both treatments.
- Treatments resulted to a supervisor shift from management to technical-management.
- 4) Response-mechanism model explained the mediating response flow.

Recommendations were given for job design and for future studies.

Davis, L.E., & Valfer, E.S. Studies in supervisory job design. <u>Numer Relations</u>, 1966, <u>12</u>, 339-352.

Reports field studies, in which some supervisory jobs were redesigned to enlarge their responsibility for product completion and others to enlarge their authority to include product quality acceptance. The consequence was an improvement in those objective organizational performances that were supported by the organizational environment at the shop level, i.e. that avoided goal conflicts for the supervisor, did not threaten achievement of his implicit objectives (seen by him to be the real goals of the organization), and avoided disincentives to him. Improvement in both objective performance and in positive stitudes was also a function of job-change complexity, developing first with low-complexity changes diven the conflict between stated management and implicit supervisor objectives, the treatments did achieve positive changes in compatible objective criteria.

Supervisors exhibited greater degrees of autonomy and indicated greater overall personal need satisfaction as consequences of both treatments. This was also seen in the workers. These behavior and satisfaction changes would seem to contribute to an organization's viability. Further, they suggest that additional improvement in output criteria may be expected as the changes are fully implemented and the system reaches a steady state.

Both treatments resulted in a shift of supervisors' time allocation from man management to technical management. Morkers respreaded positively to this change in managerial style. The treatments allowed better technical control and decision-making by supervisors through shortened feedback loops as well as through concentration of functional authority.

Authors conclude the design of a supervisor's job should be in the direction of including authority and responsibility for all the functions required to complete the product or service assigned to his work group, including quality acceptance. Where this appears to be technically infeasible, the technology and the organization should be subjected to detailed socio-technical system analysis to determine whether the restrictions are internally or externally imposed.

On the besis of the results of this and previous studies, responsibility and sutherity for work functions should be delegated to the lowest organizational level performing the work.

Devie, L.E., & Merling, R. Job design factore. Occupational Psychology, 1960, 24, 109-132.

Reports a field study in an industrial setting where job assignments in maintenance and distribution departments had been enlarged 2 to 3 yrs. previous in terms of centralization and broadening of job duties and responsibilities. Enlargement resulted in reduced costs of maintenance, improved quality of output and reduced costs (manpower) of distribution. A job content and methods sorker questionnaire correlated significantly with criterion variables and identified a number of job factors related to job design. The study involved 400 operating and 250 clerical and administrative personnel.

Davis, T.C., Pinto, P.R., & Dawis, R.V. The moderating effect of need type on prediction of overell job setisfaction. Technical Report No. 1850, March 15, 1972, University of Minnesota-Industrial Relations Center, Contract Nonr N0014-68-A-0141-0003-NR 151-323, Office of Naval Research.

Developed Triple Audit Opinion Survey (TAOS) to measure overall job satisfaction, satisfaction with different aspects of jobs, and needs of individual (defined as preference for a specific reinforcer or class of reinforcers). Results from a sample of 48 retail managers indicated 12 different need types identified by hierarchical clustering procedures. The hypothesis that need type had a moderating effect on specific satisfaction components in overall job satisfaction found support in the study. Differential multivariate weighting for each need type increased prediction level of overall satisfaction.

Davis R., & Lofquist, L.R. Toward a psychological taxonomy of work. <u>Journal of Vocational Behavior</u>, 1975, 7, 165-171.

A new approach to the construction of a psychological taxonomy of work is presented. Based on the Theory of Work Adjustment, occupational spitude patterns and occupational reinforcer-pattern clusters are cross-classified to develop psychologically homogeneous groups of occupations (Taxona). Information from other different and independently developed classification systems is imbedded in the taxon matrix. The validity of the approach is supported by the consistency and complementarity of the descriptive information in a given taxon derived from these different sources.

Davis, R.V., Weiss, D.J., Lofquist, L.H., & Betz, E. Satisfaction as a moderator in the prediction of satisfactoriness. <u>Proceedings</u>, 75th Annual Convention, American Psychological Association, 1967, 248-270.

Tested the hypothesis that the prediction of satisfactoriness from ability scores would be better for higher levels of satisfaction than for lower levels. N=352, 169 males and 183 females, approximately equal numbers in each of 1D rankings based on supervisor evaluation. Satisfaction measured with the NSO. Two criteria were employed, average production for the 4 weeks preceding testing, and supervisor evaluations based on a scale of 1 to 10 with the work group divided into tenths. Criteria correlated .42 for males and .26 for females. Abilities were measured using 8 tests from Form A of the Employee Aptitude Survey. Results showed that for males, the multiple r = .43 and .44 (p i, 0.1) for ability with average productivity and supervisor ratings. Multiple r (females) = .26 and .27 (n.e.). For the high satisfaction males, r = .63 and .69 (p i, 0.1). Low and medium satisfaction males r's ranged from .32 to .52, none were significant. These results support the hypothesis. For females, only the correlation of shiftly with average production for high satisfaction was significant (r = .63, p i 0.1), so the hypothesis was only partially confirmed. Results indicated that prediction equations should be based on maximally satisfied workers.

Deci, E.L. The effects of externally mediated reverds on intrinsic motivation. <u>Journal of Personality and Social Psychology</u>, 1971, 18,

Investigated effects of external reward on intrinsic motivation to perform an activity in three studies. An experimental and control group of students worked on puzzle configurations in three separate sessions. Experimental 5s were paid for their performance during sessions. Intrinsic motivation was defined as amount of time during an 8-minute free choice period when 5s continued to work on puzzle. Results indicated that external reward (money) decreased intrinsic motivation. The results were replicated in a field study using college students who wrote headlines for a blueskly college newspaper. One group (Ne4) of headline writers were paid 50t a headline for middle editions of the paper. The other group (Ne2) were not paid. Mntivation was measured as time to write headlines. It was assumed that the more quickly someone performs the more highly motivated. Results indicated that monetary reward decreased motivation as the experimental group took longer to write headlines and the control group showed a trend of decreasing time. Absences were used as a measure of satisfaction. It was found that the emp. groups absences increased in period after monetary reward. Third experiment was identical to first lab study except experimental 5s received a verbal reinforcement instead of messy. Results indicated that verbal reinforcement instead of increase intrinsic motivation, Disercepant findings in the literature are reconciled using a cognitive approach and concentration on the nature of the external reward.

Deci, E.L. The effect of contingent and non-contingent rewards and controls on intrinsic motivation. <u>Organizational Behavior and Human Performance</u>, 1972, g. 217-229. (a)

Investigated effects of contingent and noncontingent rewards, punishment and feedback on intrinsic motivation. Ss solved puzzles in following experimental conditions: Performance contingent on monestary reward, non-contingent monestary reward, threat of punishment for poor performance, positive or negative verbal feedback about permance, and no reinforcement (control). Intrinsic motivation was measured by amount of time out of free choice 8 minute period 5 continued to work on puzzles after completion of experiment. Results indicated that positive feedback increased intrinsic motivation. Contingent monetary reward, threat of punishment, and negative feedback decreased intrinsic motivation. Non-contingent monetary payments resulted in no change in intrinsic motivation. Results support cognitive evaluation theory which states that intrinsic motivation may be affected through a change in perceived locus of causality or process of feedback.

Deci, E.L. Intrinsic motivation, extrinsic reinforcement and imagaity. <u>Journal of Personality and Social Psychology</u>, 1972, <u>22</u>, 113-120. (b)

Experimental study of cognitive evaluation theory and inequity theory. So solved puzzles in one of six conditions: (a) not rewarded, (b) reverded with money before free choice period (if So choose to continue working on experimental task-intrinsic motivation), (c) rewarded with money after free choice period, (d-e-f) werbally rewarded in combination with one of first three conditions. Results confirmed the following hypotheses when a person is rewarded with money for performing an intrinsically motivated activity, instrinsic motivation will decrease; when a person is performing an intrinsically motivated activity and feels overpaid he will increase performance to restore equity. Verbal reinforcement increased intrinsic motivation only with male subjects. Concludes that two theories are not conceptually discrepant.

Deci, E.L. Work - who does not like it and why. <u>Psychology</u> <u>Today</u>, 1972, (August), 57-58, 92, (c)

Review of research studies involving effects of extrinsic rewards on intrinsic motivation. Explains phenomens of decreasing intrinsic motivation with extrinsic rewards on basis of locus of causality. When a person engages in a behavior for no apparent reward he explains the behavior to hisself in terms of internal causes. If a person receives an intrinsic reward like money, money is perceived as the cause of behavior (an external cause). Verbal feedback which is external increases intrinsic motivation because it affects an individuals feelings of competence and self determination. Applies theory to educational process and industry. The child in school is subject to numerous extransic controls which eliminate a child's intrinsic motivation to learn. Payment plans in industry that are tied to performance decrease intrinsic motivation. Concludes that it is unrealistic to remove all external controls as this would create chase. However, internal controls must be reestablished, as they are more effective, produce less anxiety, and maintain as individual's sense of self-estems and personal worth.

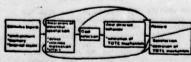
Deci, E.L. Intrinsic motivation. Technical Report No. 62, March 1973, University of Rochester, Contract Nonr H00014-67-A-0398-0015-HR 151-351, Office of Mayal Research.

Reviews and integrates a variety of research studies from the experimental psychological literature in the area of intrinsically motivated activity, including research of Whodworth, Berlyne, Butler, White, Hebb, McClelland, Schacter, Maslow, Hunt, Festinger, and Mariow. The following theories and approaches to intrinsic motivation are discussed, compared and to some extent integrated: (1) drive masling. (2) optimal incongruity and optimal arousel. (3) reduction of uncertainty, (4) compatence and self determination.

Beci, S.L. Intrinsic motivation, New York: Plenum Press, 1975.

Books centers on topic of intrinsic motivation in humans and includes a consideration of definition and conceptualization which adserts that organisms have a general need for competence and self determination. Invinsic motivation is based on seeking out situations which provide challenge and which reduce disconsence, uncertainty or reduction of incongruity.

The following graphic model is presented:



Schematic representation of a cognitive model of muticate

Extrinsic and intrinsic motivation are viewed as non-additive. Extrinsic rewards decrease intrinsic motivation though positive feedback to makes increases intrinsic motivation. Rewards contingent on performance and expected before behavior begins decrease intrinsic motivation. This occurs because rewards change the perceived locus of control and change feelings of competence and self determination.

The theory is related to cognitive dissonance theory and implications and applications of the theory are reviewed.

Deci, E.L., Cascio, W.F., & Krusell, J. Cognitive evaluation theory and some comments on the Calder and Straw critique. <u>Journal of</u> <u>Personality and Social Psychology</u>, 1975, <u>21</u>, 91-85.

Reply to criticiems by Calder and Straw on research dealing with effects of extrinsic rewards on intrinsic motivation. Performance data (amount of time spent on task) of two contingent payment studies are reported to answer criticism that decrease in intrinsic motivation was a function of satisfaction effect. Amount of payments to 8s are also reported. Criticism regarding timing of extrinsic rewards before or after free chice period is discussed. Interpretation of data that feelings of inequity cause short term activity should be explored further. Cognitive evaluation theory is discussed in terms of two processes by which extrinsic rewards affect intrinsic motivation (1) change in perceived locus of causality (2) change in one's feelings of competence and self determination. Effects of unexpected rewards on intrinsic motivation are discussed and it is hypothesized that unexpected reward (5ex differences regarding effects of werbal feedback confirms that positive feedback increases intrinsic motivation of males and decreases for females. Positive feedback congitions that positive feedback congitions also feelings of competence while it changes perceived locus of causality for females. Positive feedback is a preserved to the process of the

DeNise, A.S., 4 McCormick, E.J. The cluster analysis of jobs based on data from the Position Analysis Questionnaire (PAQ). Technical Report No. 7, September, 1974, Purdue University, Contract Nonr N00014-67-A-0226-0016-NR

Two cluster analysis procedures were used in the clustering of jobs on the basis of data from the Position Analysis Questionnaire (PAO). The PAO is a structured job analysis procedure that provides for the analysis of jobs in terms of each of 187 job elements, these job elements being grouped into six divisions, as follows: (1) Information input; (2) Mental processes; (3) Mork output; (4) Relationships with other persons; (5) Job context; (6) Other job characteristics.

On the basis of previous research, a series of principal components enalyses of the PAQ data had been carried out. One series consisted of independent analyses of the job elements withis each of these six divisions, the results of this consisting of the identification of 30 principle components (called "divisional" job dimensions). In turn, an overall or general principle components analysis was based on data from 168 of the 187 job elements (called "general" - G - job dimensions.

One of the clustering procedures used was the BC-TFY program (Tryon, R.C., and Bailey, D.E., <u>Cluster Analysis</u>, McGraw-Rill. 1970). This clustering was carried out with the 14 overall or general (G) job dimensions me applied to a reasonably varied eample of 3700 jobe. This program resulted in the identification of 33 job clusters.

The other clustering procedure was based on the scores on 21 of the "divisional" job dimensions for a sample of 800 jobs (a subsample of the 1700 jobs mentioned above). The clustering consisted of the use of a hierarchical grouping technique as applied to the data for these jobs. In particular, the clustering was carried out with an edaption of the COUAP (Coordinated occupational Data Analysis Program) as developed by the United States Air Force. This clustering resulted in the identification of 45 clusters which seemed to have reasonable homogeneity.

A subjective comparison and a statistical analysis of the results of these two clustering procedures give the impression that the clusters resulting from the BC-TMY program were somewhat were homoceneous than those resulting from the COOAP program. However, this difference may more likely be associated with the differences in the nature of the job disensions used in the two instances (those based on the various "divisions" of the PAQ, as contrasted with the general or (G) dimensions), rather than being associated with the clustering procedures as such.

Desmond, R.E., & Weiss, D.J. Comparison of worker and supervisor ratings of job shility requirements. <u>Proceedings of 79th annual</u> convention of American Psychological Association, 1971, 6.

Compared ratings of the ability requirements of jobe from 714 workers in 11 jobs and 261 supervisors of the same job. Minnesots job requirements questionnairs, which represented GAFS-abilities, was the rating instrument. Hesults indicated that worker's ratings were internaily consistent, similar in level and variability with supervisor's ratings, similar to expert ratings and in agreement with GAFS empirical validity data. Hesults indicate that workers might be of use in future job analysis.

AND MAINTENANCE AND

Dettelback, W.W., & Kraft, P. Organization change through job enrichment. Training and Development Journal, 1971, 2, 2-6.

Reports a job enrichment program at the Bankers Trust Company, Hew York, in 1969 affecting 200 employees to solve the problems of low production, poor quality, poor employee attitude, high absenteeism, high turnover rate, routine, repetitive jobs with no intrinsic interest and too much overseeing. Program was instituted with production typists in the stock transfer operations. Typists were given the opportunity to (1) change their own computer output tapes, (2) handle typing for a specific group of customers; (3) check their own work; and (4) schedule their own work. Training was given in these areas. Attitudes and satisfaction both increased. Absenteeism and tardiness decreased while production and quality increased. Job enrichment programs were then initiated into every department of thir division.

Dickson, J. W. The physical correlates of variety in work. Human Relations, 1973, 26, 715-733.

The level of variety in work in four shop floor work situations (auto assembly, meat factory, meat packing, cookhouse) was investigated by means of semi-structured interviews with the workers. Variety was found to occur mainly at the level of batches (that is, work units of one to two hours duration) and was generally unimportant in other periods of time. Discretion in work enabled the job occupants to possess more variety in work through allowing different responses to the same stimuli of the work situation. Preferences for different levels of variety were affected by such feetures of the work situation as bonus earnings and individual levels of skill on particular tasks.

This research has shown that variety is mainly provided at the level of batches and that discretion enhances the perceived variety in work. Job rotation and job enlargement schemes which concentrate on altering jobs at the batch level should be more successful than those which alter jobs at the level of operations and tasks and attempt to rotate jobs at weekly of monthly intervals.

Dickson P. Humanizing the work place. Master in Business Administration, 1975, 9, 31-36.

Description of profit sharing plan at American Velvet, a family owned textile factory and working relationships between union and management.

Also reviews Donnelly and Mirrors program that reduced costs and doubled productivity with improved quality. Donnelly workers are all salaried and belong to work teams whose rights include selling their own breaks. Morkers share in profits according to Scanlon plan.

Reviews innovations at Lincoln Electric Company (Incentive Management System) Motorola (assembly of a complete module) Minnesota Mining & Manufacturing Company (employee participation is cost cutting), General Foods (Malston-Operations Improvement plan), Mon-Linear Systems (autonomous work groups).

According to Profit Sharing Research Poundation, a million american workers were involved in profit sharing. A third of all retail firms have profit sharing.

Dieterly, D., & Schneider, B. The effect of organizational environment on perceived power and climate: A laboratory study.

Organizational Schawior and Ruman Performance, 1974, 11, 316-337.

Subject perceptions of their own power (5 dimensions) and their perceptions of 4 aspects of organizational climate were investigated as a function of three characteristics of the organizational work environment. The 2 x 2 x 3 (level of participation, stockholder or customer orientation, and position level, respectively) design (#= 120) was carried out in a laboratory setting. Climate and power perceptions were not strongly related to each other. Level of participation appeared to be the main contributor to self-perceived power both as a sein effect and in interaction with stockholder/customer orientation and position level. Stockholder/customer orientation was the main contributor to climate perceptions, generally in interaction with one or the other environmental variable but also se a main effect. Participative decision-making results in decreased self-perceived power for occupants of higher positions. A customer orientation combined with participative decision-making leads to positive climate serceptions. The study, although highly controlled, yielded some results which are related to other research of this type.

Donaldson, L. Job enlargement: A multi-dimensional process Buman Relations, 1975, 28, 591-610.

Reports the results of a job enlargement project involving 17 female operators and 28 control workers employed in assembling electrical fan heaters in a large multi-national electronics company in Scotland. Enlarged job consisted of assembly of the entire fan and testing and inspection. Enlarged job had longer cycle time, more varied operations, self pacing, self feedback about quality and more responsibility. General conclusion was that job enlargement did produce increases in job satisfaction associated with greater felt use of shitities, variety and novelty movever, there were certain dissatisfying outcomes associated with reduced social interaction and greater pace or effort at work.

Data is not reported on production or performance outcomes

Downey, H.K., Hellriegel, D., & Slocum, J.W. Jr. Congruence between individual needs, organizational climate, job satisfaction, and performance. <u>Academy of Management Journal</u>, 1975, 18, 149-155.

Tested the proposition that organizational climate interacts with individual personality in influencing job satisfaction and performance.

The subjects in this study were 92 managers from one industrial firm. These managers represented different hierarchical levels and functional areas in the firm and were with the organization for at least five years prior to the study. Organizational clirate was measured in terms of six dimensions: (1) decision making, (2) warmth, (3) risk, (4) openness, (5) rewards, and (6) structure. Personality was measured by Bernreuter.

Results indicated that job satisfaction is a function of congruency between personality and organizational climats. To a lesser extent, the congruency notion holds true for job performance.

The highly sociable individual tends to be dependent on his environment for meaning, values, and rewards. Highly sociable managers who perceive their climate as having a reward system characterized by encouragements, lack of threats, and generally humanitarian, performed higher than did those managers who perceive their climate in a similar manner but are less sociable.

To the extent that the congruence between individual needs and organization climate dimensions is important for predicting job estisfection and performance, several possible strategies are open to the organization to fully utilize this information. First, one could attempt to select those individuals whose needs are most congruent with the climate of the organization. An organization that is open, affiliative, and rewards people for high achievement could seek individuals who desire to affiliate and tend toward sociability. Second, the organization's climate can be changed to more fully utilize the predispositions of managers and others. The suthors' bias holds with this latter strategy, where possible.

Drury, C. G. Inspection of sheet materials—model and data. <u>Human Factors</u>, 1975, <u>17</u> (3), 257-265.

Human Factors, 1975, 17 (1), 257-265.

In the inspection of sheet materials in industry, two interrelated tasks are involved: visual search and decision-making. When these tasks have been studied separately, it has been found that both exhibit a speed/error trade-off. As more time is allowed for the task, errors usually decrease. However, the speed/error trade-off in industrial inspection studies shows that, as time per item is increased, Type 2 errors laccepting faulty items) decrease while Type 1 (rejecting good items) errors actually increased and tosted on the inspection of flat glass for discrete faults. Separate experiments are performed to test the ability of inspectors to (1) search for and locate known detects in sinests of glass, and (2) decide whether a small fixated circular dot is above or below the standard required. The results of these two experiments are used to derive model parameters and the model used to predict performance in the factory situation. The model predicts the same change in errors with increasing time per item as results obtained previously in flat-glass inspection.

Drury, C. G., & Addison, J. L. An industrial study of the effects of feedback and fault density on inspection performance. <u>Ergonomics</u>, 1973, 16 (2), 159-169.

Records of the performance of a group of on-line inspectors of giss items over a ten-month period were analyzed using the Theory of Signal Detection. It was found that the inspection group as a whole followed the theoretical predictions. The introduction of more rapid feedback of performance to the inspectors after twelve weeks of the study increased the effective detectability of the faults significantly. Deducing the percentage of missed faults by half. The effect of input quality level on performance before and after the change was studied. The usual drop in fault detection performance with increased quality was found and analysed to show that the inspection group were attempting to keep the outgoing percentage defective constant.

Dubin, R., & Champoux, J.E. Workers' central life interests and personality characteristics. Technical Report No. 19, August, 1973, University of California, Contract None N00014-69-A-0200-9001-MR 151-115, Office of Naval Research.

Investigated relationship of job oriented Ss, non-job-oriented Ss and no preference Ss as measured by Central Life Interest Questionnairo, and personality characteristics (Ghiselli's self description inventory) for 427 blue-coller and 141 clerical female employees of the telephone company. Job oriented males were higher on decisiveness, initiative and supervisory ability scales and low on need for job security scale. Non-job oriented males scored highest on need for job security scale and scored lowest on decisiveness, need for occupational achievement, and initiative. No preference male workers in thighest need for self-satualization and need for occupational achievement and lowest score on supervisory ability. Pemale elerical workers in three CLI groups could not be distinguished from each other at statistically significant levels in terms of personality characteristics.

Dubin, R., Champoux, J.E., & Stampfl, J.T. Central life interests and job satisfaction. Technical Report No. 17, July, 1973, University of California, Contract Monr M00014-69-A-0200-9001, NR 151-351, Office of Naval Research.

Data on central life interests and five aspects of job satisfaction were obtained in a sample of blue-collar males (#430) and two samples of clerical females (#580). Both a multiple discrimination analysis and a bivariate analysis were performed. The results of these analyses showed that central life interest was significantly related to the total sot of job satisfaction measures in two of the three samples-blue-collar and one sample of female clericals. Joboriented workers had the highest overall job satisfaction and non-job-oriented workers had the lowest. Workers with no preference in central interests had a level of satisfaction midway between the other two groups.

Satisfaction with the work itself had the strongest relationship to central life interest orientation. Morkers of all orientations were found to be consistently low in satisfaction with pay (the samples being drawn from low wage industries). Implications of these results with respect to the evaluation of work environments are discussed.

Dubin, R., Porter, L.W., Stone, E.P., 6 Champoux, J.E. Perceiving jobs in the organization. Technical Report No. 19, August, 1973, University of California, Contract Nonr N00014-69-A-0200-9001-NR 151-315, Office of Maval Research.

Investigated ratings of 164 job incumbents, 189 craft workers, and 270 supervisors on eight job characteristics of 16 installation jobs in a telephone company. Job characteristics rated were variety, autonomy, task identity, feedbace, friendship opportunities, dealing with others, prestige, (crait jobs as reference), prestige, (call tober jobs as reference). Results indicated that ratings by craft workers and supervisors were more similar to each other than either set was to the ratings of incumbents. Incumbents in entry-level jobs evaluated such jobs more highly than craft workers or supervisors, while incumbents in highly skilled terminal-type craft jobs evaluated such jobs not highly skilled terminal-type craft jobs evaluated jobs less positively than other two sample groups. So-ciability and several intrinsic characteristics (autonomy and variety) of jobs are rated higher by incumbents. Several job features linking the individual with his work (task identity, feedback, prestige-craft) are rated lower by incumbents. Conclusion that organizational environment is differentially perceived. Incumbents low rating of job features linking individual with work may be result of reality situation or "alienation".

Dubin, R., Porter, L.W., Stone, E.F., & Champoux, J.E. Implications of differential job perceptions. <u>Industrial Relations</u>, 1974, <u>13</u>,

This study measures the differential perceptions of 16 craft jobs by several groups of employees (i.e. job incumbents, peers, and supervisors) in the Plant Department of a Southern California telephone company. Major findings were that the job ratings of supervisors and peers agreed more with each other than with the incumbents. Incumbents in entry lavel positions tended to rate their jobs higher on all cheracteristics than did peers or supervisors. However, incumbents in skilled, terminal-type jobs did just the opposite. There was a tendency for incumbents in most of the 16 jobs to rate their own jobs higher on dealing with others, sutonomy and variety and lower on wholeness of job than did their supervisors and peers.

Dunlop, John T., (Ed) <u>Automation and technological change</u>. Englewood Cliffs; New Jersey: Prentice Hall, 1962.

A collection of papers given at the American Assembly in 1962. Automation, everyone agrees, poses some problems, althruch the extent to which they are major ones is a matter of controversy among the participants. Lee A. Dubridge, president of The California Institute of Technology, and Robert Heilbroner, a noted social philosopher, take the position that automation is merely one of a wast array of technological advances to which our modern society must learn to adapt. Heilbroner's historical purspective and Dubridge's analysis of the totality of social problems facing the world today are not only the best written essays in the volume but offer many very thought-provoking ideas for every citizen of our society.

These introductory essays place the problem in a framework and are followed by an assortment of chapters, each of which considers a very specific faces of the impact of automation. Most of these are written by economists and deal with such topics as the economics of the adoption of automation, and international economics.

The chapters of greatest interest to psychologists are probably the ones by Floyd Mann, "Psychological and Organizational Impacts," Melvin Anshen's "Managerial Decisions," "Collective Bargaining' by George Taylor, and to some extent Evan Clauge and Leon Greenberg's "Employment." Mann's chapter summarizes much too briefly a number of empirical studies of automation in the office and the factory. He concludes that the office jobs associated with computers have made office work much like factory work. In fact, the office worker is doing routine, specialized work, which is paced by the computer's tremendous shility to process information, with increased pressure to attain complete accuracy - a combination of factors which has often resulted in decreased job satisfaction. The old promotional ladder in offices has had many of its rungs replaced by the computer, and so the opportunity for people to work up to higher positions in a succession of small steps has been almost eliminated.

Mann also points to the disruptive effects of both types of technological change on the worker's feelings of job security and self-confidence in his own skills. Recognition of the difficulty of adjusting to new work patterns and new social relationships can lead to methods of training for new jobs and of designing work systems to preserve existing groups.

Anshen's major contribution to the volume is his suggestion that managers will be required more and more to engage in solving new problems, rather than making decisions of a routine nature. Computers can make such decisions more quickly and accurately and incorporate relevant information more systemstically than can the average manager.

Taylor sees automation as having a considerable impact on the character of collective bargaining. Union-management agreements about how to introduce automation will have major implication for society in general, since we are now committed to a philosophy of technological progress with preservation of human values. He forsees more third-party participation, e.g., government mediators, in collective bargaining to represent the public interest, and increased incidence of continuous problem-solving conferences between labor and management to replace the present system of negotiating only under crisis conditions of contract renewal time.

The book in general offers informed opinions about a variety of topics on automation.

Dunnette, M.D. Performance equals ability and what? Technical Report No. 4009, January, 1973, University of Minnesota, Contract Monr NO0014-68-A-0141-003-NR 151-323, Office of Naval Research.

After briefly reviewing psychologist's efforts to predict human work performance, results of several research studies designed to evaluate different theories of work motivation are presented (Herzberg-Two factor theory) (Valence-instrumentality-expectancy theory) (Locke's goal setting-int intionality theory) expectancy theory) (Locke's goal setting-int intionality theory) (Adam's equity or social comparison theory.) Concludes from review research that ability differences still are empirically the most important determiners of differences in job performance. As motivation changes it has direct effects on the expression of ability. It is argued that simpler measures need to be investigated as psychologists try to account for the non-ability part of human work performance. This includes sound individual difference measures of preferences, job needs and past behavior descriptions. Less chould be said about motivation per se and more done to learn about the dimensional makeup of the "what" term in the equation: PER-FORMANCE equals ABILITY and NHAT?

Dyson, B. Boover's group therapy, <u>Management Today</u>, 1973, May 57,59,60.

Brief description of team work approach at Hoover Co., Perival, England. Since 1950 a new team working method has been used. This allows individuals to interchange their jobs freely within the group. Pay rate was changed from individual piece work to group incentives.

On controlled checks taken over a series of changes from individual to team work, it was reported that the average increase in productivity was 9% which was apart from the large decrease of indirect work. Dissatisfaction was reported to be "less" than half that experienced with those on individual time study rates.

Rey points of group work teams are: (1) selection of good leader (2) groups should consist of 20-25 people (3) operators should be allowed to choose the job they like best (4) group should produce completed job or assemble (5) operators in group should be able to see the total results of the work of the group. (6) work produced by the group should be at stage where it is easy to control quantity and quality (7) group standard should be built up from the work study data of each individual (8) group should correct faulty work and (9) work records including weekly production requirements, and daily production should be on displey.

The Economist. Does your job bore you, or does Professor Hersberg? The Economist. June 6, 1970.

Journalistic brief review of Hersberg's Two Factor Theory and outline of job enrichment principles. Brief reports on job enrichment projects at AT&T and Imperial Chemical Industries-Britain.

Edgecomb, T. S. The motivational consequences of task attributes and supervision. Unpublished PhD dissertation, Cornell University, 1966.

It was hypothesized that employees who perceive task attributes differently would report different need levels. However, it was felt that the supervisor, through personality or a leadership style, could moderate the potential environmental effects.

A questionnaire was given to 500 female, non-supervisory, weekly salaried employees in a large phermaceutical company.

Through factor-analytic techniques the independent variable, i.e., those inherent aspects of a job which could properly be called task attributes, were isolated and defined. The five task attributes, were isolated and defined. The rive tasks attributes isolated were called technological autonomy, job repetitiveness, social isolation, job apphistication, and task interdependence. They were developed into summated scales which represented the independent variable.

The moderator variable, satisfaction with supervision, was operationally defined by a thirteen-item summated scale which represented employee reaction to many different aspects of a supervisor's functions.

The dependent variable, reported psychological needs, was obtained through factor analyses. The resultant sales were called, self-actualization, affiliation, financial, and job security needs.

The results indicated that reported task attributes had no significant impact on any of the perceived need levels. However, in all cases, those satisfied with their supervisor reported less needs than those dissatisfied with supervision. This would suggest that the supervisor is able to modify one's perception of the environment to such a degree that the task attributes have limited importance to one's need levels.

The results also suggested a positive relationship between needreduction and satisfaction. That is, satisfaction occurred if a need was fulfilled and vice-versa.

Elliot, J.L. Increasing office productivity through job enlargement. In the human side of the office manager's job. (No. 134, Office Management Series) New York: American Management Association, 1953, 3-15.

Reports on a job enlargement project among first-line supervisors and clerical workers at the Detroit Edison Electric Utility Company. Though there were no controls and no statistical information was provided, Filiot claimed that job enlargement reduced costs and increased production. He then assumed a positive relationship between productivity and morale. On the basis of this assumed relationship, he argued that satisfaction had increased! Cost reduction and production increase are more easily explained in this case as a result of the elimination of duplications in the work process. The report did include the recognition that some work ere prefer repetitive jobs.

Emery, F.E. (Ed) Systems thinking, Middlesex, England: Penguin Books Incorp., 1969.

Book of readings about systems thinking which is a way of looking at phenomena from biological systems to social systems. Living systems need to be analyzed as open systems in that there is an interchange of matter and energy. Human organizations are living systems and should be analyzed accordingly.

The first two parts of the book deal with the history of the ideas of systems theory and the properties of open systems. Part Three of the book defines the properties of environments that are relevant to adaptive behavior. The last section of the book contains papers that extend these ideas to enterprises that must be managed and suggest the potential of systems thinking for management practice.

Emary, F.E., 6 Trist, E.L. Towards a social ecology: Contextual appreciations for the future in the present. Plenum Press, 1973.

"A review and extension of the literature concerning the conceptual and methodological problems of the social sciences in relation to forecasting are presented in Part 1 of the book. These problems are viewed in a social ecological framework, which is believed to be the most salient approach in understanding what was happening to organizations, considered as open socio-technical, as they encountered greater complexity and a faster change-rate. The ideas developed in Part 1 are the basis for Part 2, which is concerned with the transition to post-industrial society. To cope with this transition, the authors propose a new culture of politics, assisted by adaptive planning, that will be able to regulate complex, rapidly, and unevenly changing societies.

Engolstad, P.H. Socio-technical approach to problems of process control. In Francis Bolam (Ed). Paper\_making systems and their control: Transactions of the symposium held at oxford, September, 1903. London: The British Paper and Poard Maker's Association, 1970.

Reports on enrichment project at Hunsfos Pulp and Paper Mill in southern Norway in 1964, involving 32 employees. Autonorous work groups were formed to replace strictly delineated jobs, supervisors on the shop floor, and physical separation of task operations. The work groups incorporated comprehensive multi-skill operator training and slimination of floor supervisors. Program resulted in 24% increase in average quality bonus in 4 year period.

Evans, M.G. Hersberg's two factor theory: One more test. Studies in Personnel Psychology, 1971. 2, 45-49.

Investigated effect of personality differences to account for people relating the good aspects of their job to its intrinsic aspects (responsibility, achievement) and the poor aspects of their job to its extrinsic aspects (policy, supervision, co-workers). This study investigated the impact of an external (chance, luck, etc.) vs. an internal (self-determination) orientation upon responses to Horzberg-type questions as to what contributed to feeling good or bad about the job. These hypotheses were tested: (a) internals will give more intrinsic responses; (b) internals will give balanced responses to good and bad job sequences; and (c) externals will give unbalanced responses. Data on 28 Canadian college Se from a nomowr k population did not support any hypothesis, although results tended in the direction of Hypotheses b and d.

Eynenck, H.J. Cortical inhibition, figural aftereffect and theory of personality. <u>Journal of Abnormal and Social Psychology</u>, 1955, 51, 94-106.

An attempt has been made in this paper to work out a dynamic theory to account for a number of experimental findings in the field of personality related to the concept of extraversion-introversion. Following Pavlov and Null, a theory of cortical inhibition was developed to account for observed differences in behavior and a deduction from this principle was made by extending it to the perceptual field. It was predicted that hysterics (as a prototype of the extraverted personality type) would be differentiated from dysthymics (as a prototype of the introverted personality type) in the speed of arousal, strength, and length of persistance of faqural atterefiects. A comparison of two groups of carefully selected subjects showed that (a) hysterics developed satiation and figural afterefects more quickly than did dysthymics; (b) that hysterics developed stronger satiation and figural aftereffects than did dysthymics; and (c) that hysterics developed more persistent satiation and figural aftereffects than did dysthymics; and (c) that hysterics developed more persistent satiation and figural aftereffects than did dysthymics. The differences are statistically significant and are in complete accord with prediction. In the discussion, certain persilels were drawn between hysteria and brain injury in terms of the theory outlined, with perticular reference to the aftereffects of leucotomy. Lastly, a number of predictions were made from the theory which should permit of an experimental decision as to its worth-whileness.

Factory. Which way industry...job enlargement or job specialization. Pactory, 1963, Dec., 66-67.

Presents two divergent views: job enlargement vs. job specialization. An IBM executive claims that expanding jobs to include more elements, more complex operations, the ability to make decisions, and increasing worker responsibility will result in greater productivity and decreased turnover. A Boeing executive cites examples of job specialization resulting in increased efficiency, less supervision, higher quality, and shorter training times.

Faltermayer, E. Who will do the dirty work tomorrow. Fortune. 1974, Jan., 134-138.

Bureau of Labor Statistics predict that between 1974-1985 openings in low-status menial jobs will increase faster than total employment. Absenteeism, turnover, and labor supply problems abound in those jobs. Now, a number of factors have eroded supply of people available for menial works, welfare, reduced number of school dropouts, equal employment opportunities for minorities and dislike of menial work by youth.

Society must improve pay and working conditions for munial jobs. The quality and complexity of menial work should be raised. At Mansachusetts General Hospital, service aids participate in a one month training program that atreases ameptic techniques and medical requirements of their job. Texas Instrument offers a prospect of advancement to anyone who signs on to push a broom. Some have suggested that high school students could do menial work during part of their school day. American Airlines has a force of 185 cabin service clerks who clean sirplanes. Pay starts at 4.57, hr. Some recent hires are college graduates who will use this job for future advancement.

farina, A.J., & Mheston, G.R. Development of a taxonomy of human performance: The tank characteristics approach to performance prediction. Technical Report No. 7, February, 1971, American Institutes for Messach, Contract Nonr F44620-67-C-0116, Advanced Research Projects Ayency, Department of Defense.

### Requirement:

Of the many conditions which can influence human performance, the point pointly described and leant understood are those unhodied in the task. As a consequence, the ability to relate performance observed in one task to that observed in other tasks is limited. The present research describes a series of studies conducted to develop an instrument in terms of which the stimulus, procedural, and response characteristics of tasks could be described. It discusses additional studies which were designed to determine whether dimensions comprising the descriptive language represented correlates of human performance.

The basic steps in this research were to: (a) develop descriptive characteristics of tasks; (b) assess the reliability of rating scales devised to measure these characteristics; and (c) determine if these characteristics represented correlates of performance.

The overall direction taken by the project was influenced by a heuristic model which viewed performance as a function of three sots of antecedent conditions: the operator, the environment, and the task. A decision was made to focus initial efforts on the task component of the model, holding the other components in abeyance.

Toward this end, major components of a task were identified and treated as categories within which to devise task characteristics or descriptors. Each characteristic was cast into a rating scale format which presented a definition of the characteristics and provided a seven-point scale with defined anchor - and mid-points along with examples for each point. Nineteen scales were developed and evaluated in a series of three reliability studies.

The paradigm used to determine whether the task characteristics were correlates of performance upon which predictive relationships might be established was that of "post-diction". Post-diction referred to the situation in which performance measures were abstracted from studies already existing in the literature. Subjects rated descriptions of the tasks used in these studies on task characteristic scales and then these ratings were subjected to multiple regression analysis to establish the extent to which they were related to the performance in question. Two such post-diction studies were conducted. The first post-diction study involved six scales and 26 tasks while the second study involved six scales and 26 tasks.

#### Pindings:

In general, it was found that a subset of scales having adequate reliability consistently emerged in all three reliability studies. The results of the two post-diction studies were encouraging in that significant multiple correlations of .82 and .75 were obtained between task characteristic ratings and the performance

### Utilization of Findings:

Although a final interpretation of these findings must await cross-validation efforts, it does appear possible to describe tasks in terms of a task-characteristic language which is relatively free of the subjective and indirect descriptors found in many other systems. Further, task characteristics may represent important correlates of performance, as shown here, it was possible to describe subtle differences among tasks and to relate such differences systematically to variations in performance.

Farr, J. L., O'Leary, B. S., & Bartlett, C.J. Effect of work sample test upon self-selection and turnover of job applidants. <u>Journal of Applied Psychology</u>, 1973, <u>58</u>, 283-285.

Hypothesized that job applicants who were administered a preemployment work sample test and who, consequently, had a more accuriate expectancy about task requirements would have a higher job refusal rate and a lower voluntary turnover rate than applicants not administered the work sample test. Ss were 67 white and 93 black female applicants for the job of sewing machine operator. Some support for the hypotheses was found for white Ss but not for black Ss. Racial differences are explained in terms of the differential importance of factors in the work situation.

Paunce, W. A. Automation and the automobile worker. Social Problems, 1958, 6, 68-78.(a)

Report on interview results from 125 workers selected randomly from four large machining departments of a Detroit engine plant. Respondents were asked to compare their last previous non-automated with their present automated job in terms of job content, working conditions, patterns of social interaction and work satisfaction.

Results were as follows in the area of job content: Automated jobs reduced amount of materials handled by worker, decreased workers control over work pace, and required more constant attention on part of the worker. No differences were found in worker's comparison of training required, skill, and ability needed of monautomated and automated jobs. Morkers indicated that automated jobs involved more responsibility, were more important and produced greater fatigue. No differences were reported in a comparison of working conditions.

Morkers who preferred non-automated jobs reported less social interaction on automated jobs, too much supervision on automated job; it was harder to get along with foreman on automated job, and greater tension and anxiety in automated jobs.

Negro workers were more satisfied with automated jule than white workers. Morkers with higher education were less satisfied with automated jobs, workers with rural backgrounds were dissatisfied with automated jobs.

Article does not contain complete statistical data. Only a few percentages are reported.

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Faunce, W. A. Automation in the automobile industry. American Sociological Review, 1958, 23, 401-407. (b)

Reports on results of interviews with 125 workers selected randomly from four large machining departments of a Detroit autoengine plant. Respondents were asked to compare their old job is the non-automated plant with their present automated job.

The following results were reported: automated jobs required closer and more constant attention, in automated plant there was a greater distance between work stations. There were fewer jobs in automated plant where work pace was controlled by the operator, fewer jobs in automated plant required teamwork. In automated plant there was less social interaction on the job, work interaction groups are significantly smaller in automated plants, and in automated plants workers reported more frequent contacts with foremen and supervisors.

Feather, N. T. Valence of outcome and expectation of success in relation to task difficulty and perceived locus of control.

Journal of Personality and Social Psychology, 1967, 7, 372-386.

Tested the relationship of attractiveness of success and repulsiveness of failure to the subjective probability of success at a task varying in difficulty and if success was attributed to skill or chance. 76 Ss provided estimates of probability of success, attractiveness of success and repulsiveness of failure for each of 10 levels of objective difficulty of the same task for the lat and 15th (last) trial of the task under two experimental instructions (success or failure dependent on skill or chance). Results indicated that under skill instruction probability estimates and repulsiveness estimates were higher and decreased more rapidly with increasing difficulty for the last trial of the task. In chance condition primacy effect was found for attractiveness (estimates increased more rapidly with increasing difficulty on the 1st trial of task). No relationship was found between rate of change measures and N achievement, debilitating anxiety and Rotters 1-5 scale. Results are discussed in terms of the importance of situational context in determining degree to which S sees self as responsible for his success and finiture and his reaction to the outcome.

Fein, M. Approaches to motivation. Unpublished paper, 1970.

Essay on past approaches in the last 10 years to raise employee motivation. Review includes worker participation programs, job enrichment at AT 6 T and Texas Instruments, work simplification, Herzberg and McGregor and role of money or fulfillment in work motivation.

Concludes that some of the prominent psychologists have made two basic errors in formulating their behavioral proposals:

- 1. Workers have a need to find fulfillment in their work.
- Workers will identify with management's goals when management adopts managing strategies which will offer workers greater participation and identification with their work.

The basic cause of productivity retardation is described in the theorem. The actions which workers take are the symptoms which management perceives. These are labelled as corollaries, since they arise from the basic relationship.

- Corollary 1: If workers do anything to raise productivity, some of them will be penalized.
- Corollary 2: Workers will not cooperate in productivity improvement when their job security is not assured.
- Corollary 3: Workers have strong incentives not to cooperate with management, especially in the short term period.
- Corollary 4: Morkers consider their own interests before management's. Management's goals will be sceepted by workers to the extent that the goals are perceived by workers as beneficial to them.
- Corollary 5: Most workers will not accept management's strategy that workers should participate and identify with their work because they do not view it as a need nor in their best interests. Neither such workers nor management derive benefits from participation and job enrichment
- Corollary () A minority of workers obtain fulfillment from their work. These are the self-actualizers who identify with management (Approximately 15% or workers).
- Corollary 7: Workers press for their needs in unmistakable terms. Attempts by management to provide alternatives not demanded by workers will not diminish workers' expressed needs. Moreover, sanagement's motives may be questioned and resented.

The relationship of job security to motivation can be seen in the propositions that:

- A relatively high level of economic security for workers in a given plant is an essential precondition for fostering the will to work. Only when this has been established can the various motivational theories have any chance of success.
- Workers must be motivated to achieve a high level of productivity.
- Increased economic security without positive motivation will only raise costs, not productivity.
- Workers will respond to metivational inducements in direct proportion to their economic security.

In short, the productivity of workers will be highest when they are motivated and when they do not fear working themselves out of their jobs.

A more logical approach is to:

- Stop paying attention to the 15% high achievers. They
  will do their thing without management's encouragement.
  But they must not be frustrated by the non-involved employees.
- Concentrate on the 85% non-involved workers. Develop ways to motivate them in terms which they will perceive as meaningful.
- Create an environment which the non-involved can accept and identify with. Break down some of the traditional barriers between management and labor.
- Demonstrate to all employees that management is genuinely concerned with the problems and conditions that are important to them, such as job security, fear of loss of income, rising cost of living, etc.
- 5. Develop a way to give all employees a piece of the action. If workers come to work to eat, to exchange their skills and efforts for what they can buy back outside of the work place, then it is reasonable to expect that if they are given an opportunity to obtain more of the eating stuff, this may soctivate them.

Foin, M. The real needs and goals of blue-collar workers: A critical examination of a "Survey of Working Conditions" prepared for the U.S. Department of Labor, The Conference Board Record, (Pub.), 1973, 2-8-30.

Reanalyzes data from this survey. Morkers were asked how important they considered some 25 aspects of work, including pay, working conditions, and relations with coworkers. The results may be surprising to those who believe workers are interested mainly in pay.

Of the five work features rated most important, only one had to do with tangible or economic benefits. And that one (gool pay) was ranked number 5. Ranked above pay were interesting work, enough information to get the job done, and enough authority to do the job.

Work aspects rated sixth, seventh, and eighth in importance were: opportunity to dowelop special abilities; job security; and seeing the results of one's work.

Of the eight top-ranked aspects, six had to do with the content of the worker's job.

When the data are refined into occupation categories, it is seen that widely accepted findings about (composite) worker's needs and interests do not hold for blue collar jobs. Morkers in each of three blue collar work categories hold pay higher than interesting work. And job security comes ahead of that. Moreover, a study of foreign workers also shows that pay and job security are the unskilled workers' basic needs. Finally, with interesting work not the primary need of workers, the question of job enrichment now takes on different perspectives.

Feih, M. Job enrichment: A reevaluation. Sloan Management Review, 1974, 15, 69-88.

Based on an extensive review of the job enrichment literature, Fein concludes that there are few, if any, genuine cases where job enrichment has been applied successfully to a large, heterogeneous work force. Nost application of job enrichment either have been common sense job redesign or have occurred among such a select group of workers that the success of the program was independent of its content. Contrary to the opinion expressed in Mork In America, the author finds that the intrinsic nature of the job is secondary in importance to many blue-collar workers. Of primary concern to the blue-collar worker are his pay, his job security, and the rules of his work place. Job enrichment has not worked, because it has not addressed these problems. In order to increase productivity in America, the author auggrats a new approach to job design which balances more thoughtfully both the intrinsic and extransic motivational factors. He critically reviews job enrichment projects at General Foods, Proctor and Gamble, Texas Instruments, Polaroid and ATST.

Fine, B. J. Intrinsic motivation, intelligence and personality related to cognitive and motor performance. <u>Perceptual and Motor Skills</u>, 1972, 34, 319-329.

Tested a measure of generalized intrinsic motivation (Length of time Ss endured a noxious stimulus-hand immersion in 5°C water-no external rewards or punishment). Ss (54 soldiers) completed Cattell 12 O-A Battery, Cattell 16 P-F Test, Maudsley personality inventory, and biographic questionnaire. Criterion variables were performance on following tasks: anagrams, digit symbol, substitution, screw sorting, and titrated hand dynamoter. Results indicated that subjects who endured noxious stimulation longer performed better on all tasks. However, this predictor accounted for less variance in the criteria than intelligence, personality, and biographic factors.

Fingerman, P. M., Einner, E., Rose, A. M., Wheaton, G. R., & Colfen, F. Methods for predicting job ability requirements: III Ability requirements: as a function of changes in the characteristics of a concept identification task. Technical Report No. AIR-31300-4175 TR R75-1, April, 1975, American Institutes for Rasearch, Wambington, D. C., Contract Nonr NO0014-72-C-0382, NR 151-347, Office of Naval Research.

This report describes the third study in a program of research dealing with the relationships between the characteristics of human tasks and the abilities required for task performance. The goal of the program is to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. Such knowledge has important implications for both selection and training of personnel.

The present study investigated the relationship between variations in a prototypic problem-solving task, concept identification, and consequent changes in the abilities related to problem-solving performance. Characteristics of the problem-solving lask were samipulated by varying the formal difficulty and percentual complexity of the problems. Subjects performed the criterion task under the different experimental conditions, and then received a battery of reference tests designed to measure abilities which were hypothesized to relate to problem-solving performance. To determine the relationship between task characteristics and ability requirements, the test battery was factor analyzed to identify a reference ability structure. The loadings of the various criterion task conditions on that structure were then estimated.

Six separate ability factors were identified; four were found to be related to criterion task performance. The ability relationships seemed not only to reflect task variations, but also to depend on the various dependent variables. These dependent variables were hypothesized to relate to different aspects of performance.

The results of the study suggested that cortain task variations change the nature of the task in such a way that subjects change their approach or strategy for dealing with the task. Such changes in approach may require different ability profiles; thus they may account for changes in abilities related to performance as a function of changes in task characteristics. Purther analysis is planned to examine the interaction of task variation, subject strategies, and ability profiles.

Fiske, D. W., & Maddi, S. R. <u>Functions of varied experience</u>. Homowood: Illinois. Dorsey Press, 1961.

Pregents conceptual framework of effects of variation in stimulation in contributing to normal development and functioning of organism. Also presents a view that varied experience is sought out by organisms and contributes to the affective state of human beings. Presents eight conceptual proposals:

- The impact of a stimulus is its momentary contribution to the activation level of an organism.
- (2) An organism's level of activation varies directly over time with the total impact of current stimulation.
- (3) The impact of a stimulus is derived not only from the intensity and meaningfulness of the stimulus, but also from the extent to which it provides variation from prior stimulation.
- (4) For any task there is a level of activation which is necessary for maximally effective performance (U shape function).
- (5) The behavior of an organism tends to modify its activation level toward the optimal zone for the task at hand.
- (6) For each stage in an organisms sleep-wakefulness there is a characteristic or normal level of activation.
- (7) In the absence of specific tasks, the behavior of an organism is directed toward the maintenance of activation at the characteristic or normal level.
- (6) Negative affect is ordinarily experienced when activation level differs markedly from normal level: positive affect is associated with shifts of activation toward normal level.

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Pitzgerald, T. H. Why motivation theory doesn't work. Harvard Suminess Review, 1971, 49, 37-44.

States that the seriousness of motivation problem in industry has been underestimated. Reviews three approaches to
the problem: enlargement, training and participation. Author
states that he is skeptical over application of job enlargement
to a wide variety of work situations and the long range effects.
As time peases, the added challenge of an enriched job may decrease. Now do you explain the boredom and fading motivation
of those with amply challenging jobs? (e.g. Executives, doctors, college professors). He recommends that instead of thinking of employees as objects to be manipulated, management must
strive to effect fundamental value-oriented changes in the
structure of rationalized work.

Fleishman, E. A. A comparative study of aptitude patterns in unskilled and skilled psychomotor performances.

Applied Psychology, 1957, 41, 263-271. (a)

Cross-sectional and longitudinal comparison of abilities of 200 basic traince airmen involved at early and late stages of proficiency on a variety of complex psychomotor tasks. (Rotary pursuit, plane control, kinestetic coordination, unidimensional matching, two-hand matching, and discrimination reaction time). Methodology included extended practice on these tasks by Ss who completed a battery of reference tests which measured abilities related to the experimental task. Factors defined by reference tests were examined for loadings in different stages of practice on the tasks. Results indicated considerable but systematic changes in pattern of abilities contributive to proficiency on complex tasks as training continues and proficiency increases. The kinds of abilities contributing variance at advanced proficiency were defined by other psychomotor tasks than the refurence tests which contributed to much of the variance early in learning. For example, kinsethetic ability plays an increasingly important role at higher levels of proficiency.

Fleishman, E. A. Factor structure in relation to task difficulty intesychomotor performance. Educational and Psychological Measurement. 1957, 17, 522-532. (b)

Study of 200 basic trained airmen who completed a visual discrimination and reaction psychomotor task - the response orientation device and a battery of reference tests.

The study, which was frankly exploratory, has shown that certain perceptual and spatial abilities are important in certain kinds of psychomotor performances. Furthermore, the relative importance of the different abilities may depend on the difficulty of the task. An important methodological point is the finding that factor analysis methods, used in combination with experimental variations in laboratory tasks, may be a useful approach to the study of individual differences in complex performances. It is felt that future work along these lines may also provide useful information on the relationships between physical dimensions of complexity in psychomotor tasks and the aptitude requirements for performing such tasks.

Pleishman, E. A. Attitude versus skill factors in work group productivity. <u>Personnel Psychology</u>, 1965, <u>18</u>, 253-266.

Studies the effects of participation on resistance to change and on productivity of 400 employees of a dress manufacturing company. An attempt was made to separate, experimentally, a drep and recovery in production each time a production change occurred due to either attitude factors or to skill learning factors. Results tended towards a causative factor of attitude. It also appeared that direct participation of individual workers may not have been as important an incentive as perceived participation of the group in work changes.

Pleishman, E. A. Human abilities and the acquisition of skill. In E. A. Bilodeau (Ed.) <u>Acquisition of skill</u>. New York: Academic Press, 1966.

Relates and defines ability and skill. Skills involve spatial-temporal patterning, interaction of responses with input and feedback processes and learning. Typically, there is very little fluctuation in the levels of abilities during adult life span. Abilities are empirically derived from factor analysis. Presents a taxonomy of perceptual motor abilities. Se pre-task abilities become major treatment variables with significant interactions with learning trials and with other learning phenomens.

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Fleishman, E.A. Development of a behavioral taxonomy for describing human tasks: A correlational-experimental approach. <u>Journal of Applied Psychology</u>, 1967, 51, 1-10. (a)

Discusses need for identifying a set of unifying dimensions underlying skilled behavior. The issues bear on problems of generalizing principles from laboratory to operational tasks and from one task to another. Combinations of experimental and correlational approaches appear to be required. The conceptual framework and research strategy utilized by the author in his research on perceptual-motor abilities is described and its relevance to taxonomy questions discussed. The integrative nature of the framework developed is illustrated by a wide variety of studies, in laboratory and operational situations, ranging from those of skill learning and retention to the offects of environmental factors on human performance, and in the standardization of laboratory tasks for performance assessment.

Pleishman, E. A. Human abilities and verbal learning. In Gagne R. (Ed.), Learning and individual differences. Columbus, Ohio: Charles 4 Merfill books, Inc. 1967. (b)

Discusses multi-factor theory of learning which includes change in contribution of individual differences variable at different stages of learning, increased specificity of performance at advanced levels of learning and that individual differences are a function of task specific factors. Applies theory to verbal learning process. Discusses research on following ability factors related to verbal learning process, or the second of the second process of the second process. The second representation of the second process of the second representation of the second representation of the second representation of the second representative individual difference to the second relation to learning should be explored. A major personality variable to be explored is cognitive style.

Fleishman, E.A. Individual differences and motor learning. In R.M. Gange (Ed.) Learning and individual differences. Columbus, Ohio: Charles E. Merrill Books Inc., 1967. (c)

Overall review of research relating individual difference variables to the learning of motor skills. Concept of abilities is central to this work. Ability is defined as general trait of individual inferred from certain response consistencies on certain kinds of tasks. Abilities are discussed in terms of skill distinction, skill learning, learning parameters, information processing, transfer and measurement. A taxonomy of human motor abilities based on experimental factor analysis is presented. Taxonomy includes control precision, multiline occidination, response orientation, reaction time, speed of arm movement, rate control, manual dexterity, finger dexterity, arm-band steadiness, wrist-finger speed, aiming. Following taxonomy refers to physical proficiency: extent flexibility, dynamic flexibility, straingth, dynamic strength, trunk strength, gross body coordination, gross body equilibrium, and stamina. Research studies relating abilities to skill acquisition show particular combination of abilities to skill acquisition show particular combination of abilities contribute to performance changes as practice continues and these changes are progressive, systematic and eventually hecome stabilized. The contributions of non-motor abilities (e.g. verbal, spatial) which may play a role in early learning decreases systematically with practice relative to motor abilities. There is also an increase in a factor specific to the task itself. Renearch in alms reported on complex training on a tracking task, part-whole task relations, and retention. Systematic changes in a factor specific to the task itself. Renearch in alms reported on complex training on a tracking task, part-whole task relations, and retention. Systematic changes in terms of ability requirements. An approach which defines rasks in terms of abilities required to perform them can provide avenues to task standardization.

Fleishman, E. A. Performance assessment based on an empirically derived task taxonomy. <u>Human Factors</u>, 1967, 9, 149-366. (d)

Reviews and discusses a number of the methodological questions relating to the application of an experimental-correlational approach to the problem of assessing complex performance. The basic point of departure is the specification of the requirements for a task taxonomy and an analysis of the value of factor analytic investigations in combination with experimental methods in providing the framework for such a taxonomy. The way in which this approach have been applied in the past and the expected benefits of its successful implementation are discussed. It is concluded that experimental-correlational studies offer considerable promise in attacking complex performance but that a more extensive research program is needed. The general outlines of such a program are described.

Pleishman, E.A. Toward a taxonomy of human performance. American Psychologist, 1975, 1127-1149.

General review article that centers on need for a taxonomy of human performance which provides an integrative framework and common language applicable to a variety of basic and applicad areas. Such a taxonomy should have certain characteristics. It should identify important correlates of learning, criterion performance levels and individual differences and should be applicable to laboratory tasks and to tasks encountered in on-the-job situation.

Fleishman reviews the purposes of task classification and four major conceptual bases underlying current task description and classifications. These four approaches include (1) behavior description (2) behavior requirements (3) ability requirements approach (4) task characteristics approach.

Fleishman reviews his work on ability requirements approach. He has tried to lay out some general issues in taxonoric development and to give some examples of measurement approaches and methods of evaluation of taxonomic systems. Some studies were shown in which predictions and generalizations about human performance may be enhanced through applications of such task classification systems. We have dained some additional understanding of criterion performance as a result of this work. From his work thus far, a few additional observations are pwssable. The search for a single general taxonomy is not likely to be successful for all purposes. We may, indeed, need several task classification systems for several purposes, with the linkance between them understood and specified. A taxonomic system linking ability requirements and task obseracteristics appears to hold promise for providing an organizing framework. The process will be an iterative one. Taxonomics are not out there to be discovered; some invention is required. However, this invention must be grounded in empirical data, research, and evaluation. The research paradigm described, which includes combinations of experimental and correlational methods, seems a useful way to go about it.

Fieishman, E.A., & Ellison, G.D. Prediction of transfer and other learning phenomena from ability and personality measures. Journal of Educational Psychology, 1969, 60, 300-314.

Investigated extent to which personality measures (Maudaley Personality Inventory, Anxiety Scales, Scales measuring rigidity and test anxiety scales) and ability measures predicted (A) the transfer effects of associative interference when S is shifted to account task, and then shifted back to original task. (B) Performance during the following a massed trial task. (B) Performance during the following a massed trial with misorter spaced trial. Sa were 57 undergraduate students. First task was Bi-Manual Matching device. Second task was a reversal of the display control unit of the matching device. Multiple correlational analyses among predictors and task variations indicated following vaulus: (1) ability measures predicted performance level during all original and reversed tasks, but personality measures did not. Nate of learning was not predictable from either ability or personality measures, as it may be more specific to the task. Certain ability measures predicted transfer effects but the particular measure depended on the shift point. Performance during distributed practice. Performance during the trial following massed practice showed a sharp decrease in prediction by shiftly measures and an increase in prediction by personality measures. Ss higher in extroversion and lower in analety performed better during this trial.

Ford, R.N. Motivation through the work itself. New York:

Reports on 19 field studies of job enrichment programs at A.T.4 T. begun in 1964. Enrichment procedures involved, (a) removing some controls, (b) increasing personal accountability, (c) improving knowledge of resulta, (d) redesigning a complete function to assign each job a meaningful unity of work, (3) assigning to job duties, suchority and responsibility formerly assigned to the job at the next higher level. In a six month enrichment program with sorvice representatives at eight different locations, results indicated a substantial decrease in resignations and dismissals. Author concludes that job dissatisfaction and turnover can be decreased by improving only the work itself which will lead to increased productivity. The field studies from a technical standpoint are confounded by a variety of variables. However, the book clearly shows how the program was developed and that the cost of such a program can be self liquiditing.

Some of the enrichment programs are outlined below:

- Framemen (N=35-40) work expanded to include the worker taking full responsibility for work and negotiating with customers. Results indicated reduced worker grievances, higher morals, slight increase in productivity, no change in absenteeism.
- (2) Shareholders correspondents (N=95-120) workers given less supervision and more job freedom to compose and eign letters to shareholders. Results indicated decreased absenteeism and turnover and increased promotions.
- (3) 17 groups of workers (N-1200) workers included diverse occupations: toll operators, installers, clerks, and equipment engineers, key punch operators. Job enrichment involved same concepts and changes made with shareholders correspondents. Results indicated decreased turnover and overtime hours.

Ford, R.N. The obstinate employee. Public Opinion Quarterly, 1969, 11, 301-310. (b)

In an address to American Association for Public Opinion Research, Ford concludes that the job and the work itself caused absenteeium and turnover. Describes job enrichment project involving 14 keypunch operators. Reports that enrichment programs involving 600 A.T. 4 T. service representatives at 12 locations resulted in a turnover drop of 14 percentage points from a base of 19th. Points out to weaknesses in job enrichment approach (e.g., understanding value of work to individual, relationship of extrinsic and intrinsic rewards, role of individual differences, problem of the permanence of job enrichment).

Ford, R.N., & Borgatta, E.F. Satisfaction with the work itself. Journal of Applied Psychology, 1970, 54, 128-134.

Reports on the construction and development of a scale to measure attitudes toward "work itself". The following eight attitudinal variables were identified by factor analysis: (1) the work itself is interesting, (2) the job is not wasteful of of time and effort, (3) I often feel the need for more freedom in planning the job, (4) I have reasonable say on how my job is done, (5) the job provides opportunities, (6) the job provides feedback. (7) the job is too closely supervised, (8) it is not worth putting effort into the job. Alpha reliabilities of scores are reported for six samples.

Ford, R.N., Borgatta, E.F., & Bohrnstedt, G.W. Use of the Work Components Study with new college level employees. <u>Journal of</u> Applied Psychology, 1969, 51, 367-376.

Established reliability and intercorrelation structure of Work Components Study (WCS) using sample of 869 male and 344 female college level personnel. MCS did not show differences in employees who renain with the company, those who leave at their own initiative; or those who leave at the company's initiative. WCS scores 3, (compotitiveness-desirability), Score was billy score and behavioral self-rating responsibility scores were combined to predict the companies rating after 1 year of employment or number of years required for the employee to reach 1rd level management.

Form, M.H. The accommodation of rural and urban workers to industrial discipline and urban living: A four-nation study. Rural Sociology 1971, 36, 497-505.

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Interviewed stratified representative samples of automobile workers (craftamen, machine operators and assembly line workers) from four countries (India, Argentina, Italy and U.S.). About one-third of all workers were some of farmers. In all coentries a somewhat higher per cent of urban as opposed to rural verkers were exhiled. Rural born workers were older, had less clucition and more work tenure than most urban workers. Morkers in the least and most industrious countries (India and U.S.) preferred to work in a rural setting. There were no differences between urban and rural workers in job satisfaction or work conditions. Two-thirds of all workers indicated high occupation, substitutional most workers expressed considerable satisfaction with workmatos. Nork tenure was related to occupation, job and work satisfaction. Author concludes that the lack of persistent or systematic differences among urban-rural backgrounds supports the industrial man hypotheses that workers from different social and cultural backgrounds adapt rapidly to the occupational and social systems of industrial society rather than the developmental hypotheses that adaptation vary according to stage of industrial-isation.

Form, W.H. Auto workers and their machines: A study of work, factory, and job satisfaction in four countries. Social Forces 1913. 22, 1-15. (a)

Reviews social scientists attitudes about the deadening effects of increasing mechanization and job routinization on the lives of industrial workers. Three areas of work satisfaction were studied for four operations which varied in amount of worker control. Respondents were auto workers in four countries which varied in extent of industrialization. Most workers believe that their work integrates their lives, they prefer to work in the industrial sector, and they report that their jobs are satisfying. Bothers did assembly line workers dual upon monotony. In all countries this skill and high work controls were associated with high job satisfaction. Lower skilled workers were relatively sore satisfied in countries at lower levels of industrialization. Other small and inconsistent differences were found in the three areas of satisfaction according to the degree of worker control over the job and degree of plant mechanization. From Herx to Mercuse, diese about the deadening impact of mechanized and routinized work need serious reconsideration.

Form, W.H. The internal stratification of the working class: System involvements of auto workers in four countries. <u>American</u> Sociological Naview 1971, 38, 697-711. (b)

The relevance of structural differentiation for social stratification has rarely been studied empirically. This issues the stratification has rarely been studied empirically. This issues the stratification has rarely been studied empirically. This issues the stratification of stratification of the stratification of stratification

Form, W.H. The social construction of anomic: A four pation study of industrial workers. American Journal of Sociology, March 1975, 80 (51, 1165-1191.

Responses to anomic scales are typically interpreted as signs of personal confusion. Actually, however, specific societal conditions can explain the extent of anomic which actus observer, if their observations are interpreted as social constructions of societal normlessness. This research concerned variations in constructions of anomic by workers in four countries according to extent of industrialization, the workers' place in the skill hierarchy, and their pattern of social system involvement. Anomic observed was related to the extent of industrialization, but place in the skill hierarchy and the pattern of system involvement for a superior of the scale of the skill hierarchy and the pattern of system involvement concerning societal anomic were countries, beliefs concerning societal anomic were not related to skill level or pattern ideology and the ability of workers to see effective linkages between union and national politics.

Possum, J.A. Urban-rural differences in job satisfaction. Industrial and Labor Relations Review, 1974, 27, 403-409.

Study of 37 subjects hired by Michigan State University and 39 subjects hired by University of Wyoming to complete an experimental job of computer coding to investigate urban-rural differences.

There was no significant difference in performance between the two groups. The differences in job satisfaction found in this experiment were small but consistent and indicated that the subjects with a rural socialization tended to be more satisfied with their pay and with performing a repetitive task than were urbansocialized subjects.

Poulkes, F.P. Creating more meaningful work. New York: American Management Association Inc., 1969.

Reports on programs at four companies to create more meaningful work. Polaroid Corporation in 1969 instituted a job rotation and job exposure program involving over 2000 employees. Factory operators were rotated between their jobs and more desirable challenging jobs. The job exposure program allowed factory workers to experience laboratory jobs. Results of program indicated roduced turnover and absenteeism and easier recruitment for factory jobs.

At Texas Instrument vertical job enlargement involved 600 female employees in 1967. Employees set own production standards, design of work layout, and inspection and testing of the product. Enlargement program resulted in decreased absenteeism, turnover, dispensery virits, and improved morale. Assembly time per unit decreased during experiment.

At A.T. 6 T a job improvement program in 1965 involved 120 female employees in customer service department who answered shareholder inquiries. Vertical job loading included allowing employees to decide on job assignments, and sign and compose their own correspondence. Supervision was reduced as well as an emphasis on production. Results indicated higher job satisfaction and decreased absenteeism and turnover.

At H.B. Hood and Sons Inc. a work simplication program using a cash award system for suggestions was initiated. Norkers teamed with supervisors to rinplify work. Films of actual work operations were studied. A mechanical conveyor in the truck loading process increased status of the truck drivers. The company in addition to the work simplification program guaranteed job security for workers with two years seniority. This reduced employee resistance to change.

Pox, J.G. & Haslegrave, C. M. Industrial inspection efficiency and the probability of a defect occurring. <u>Ergonomics</u>, 1969, <u>12</u>, 713-721.

Following Colquhoun's more general result that in a vigilance task probability rather than frequency of occurrence determines an operator's efficiency, the effect of 'probability' has been tested on the shop floor inspection department of firm manufacturing acrews (N = 10 women) for probabilities in the range 0.01 to 0.05 for paced and unpaced inspection.

A 'probability' effect was found for the 'unpaced condition'.
Raising the probability increased the level of detection of defects significantly.

The laboratory experiments suggest that vigilance performance is determined in part by randomly varying processes in the central nervous system whose mean value is changed by the arrival of a signal and that a signal is reported every time a critical level is reached. The theory predicts that there will be a certain proportion of false reports and that these will increase as the critical level is lowered. The three experiments indicate that increasing the probability of a defective screw appearing led to an increase in the number of false detections.

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Frank, L.L., & Hackman, J.R. A failure of job enrichment: The case of the change that wasn't. The Journal of Applied Behavioral Science, 1975, 11, 413-436.

"A job enrichment project undertaken by the management of a stock transfer department of a large bank is evaluated, total N-59. The project involved creation of semi-autonomous work groups, intended to function as "minature stock transfer departments" within the larger department. Quantitative and qualitative data on the effects of the change are reported. Results show that the job enrichment project failed to alter significantly either the jobs themselves or the work attitudes and behavior of department employees. Jobs tended to get worse rather than better after the change to work module. Reasons for the failure to achieve meaningful change are analyzed in terms of the general conditions that may be required for "successful" implementation of job enrichment. job enrichment project undertaken by the management of a

French, J. R. P., Jr. Person role fit. Occupational Mental lealth, 1973, 3 (1), 15-20.

Reports research results from two space centers involving managers, engineers, and scientists. The hypothesis tested was that the goodness of fit between the environment and the person involves the degree to which skills and abilities match the deman and requirements of the job and the degree to which needs of 1ndi viduals are satisfied. Misfits result in job dissatisfaction, depression, physiological strains, and other symptoms of poor mental health. The relationships with one supervisor and work group can act as a buffer between stress and strain physically, but not psychologically.

erench, J.R.F., Jr., Israel, J., & Au, D. An experiment on par-ticipation in a Norwegian factory: Interpersonal dimensions of decision making. <u>Hugan Relations</u>, 1960, <u>11</u>, 3-19.

Report of Norwegian replication testing a more refined theory of participation using controlled methods. The hypotheses predicted that increased participation (and the opportunity to garticipate) would affect production, labor-management relations, and job natisfaction only to the extent that four conditioning variables were present: (a) the decisions were important, (b) the content of the decisions was relevant to the dependent variable, (c) the participation was considered legitimate, (d) there was no resistance to change (i.e. no negative reaction to the methods of managing the change).

In a Norwegian factory, nine four-man groups were changed to producing new products. The four control groups were changed by the usual methods, but the five experimental groups were given more participation. Each of the five experimental groups met with their forcas and representatives of the planning department to plan which of the five new products should be assigned to each of the five experimental groups. Two of the experimental groups held two additional meetings in which they participated in deciding about the division of labor into four jobs, the assignment of these jobs to group members, and the training for the new jobs.

Questionnaire responses demonstrated that all three types Questionnaire responses demonstrated that all three types of meeting produced psychological participation (i.e. a perception in the workers that they had high influence on the decisions made). However, the manipulation cannot be considered very strong, because these four areas of decision-making were of only medium importance to the workers and because only two groups participated in more than one area. Measures of the dependent variables were obtained from production records and from a post-experimental questionnarie.

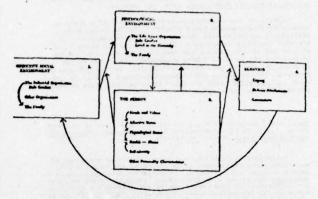
There was no difference between the experimental and control groups in the level of production. This result is partially predictable from the hypothesis about relevance, since none of the four areas of decision-making was very relevant to production. The very strong production ceillings constituted a further reason why there was no differences in production.

With respect to worker-mannyement relations, there was support for the hypotheses that the effects of participation hold only for subjects who experience at least as much participation as they consider legitimate. There was equal support for the hypothesis that the effects of participation increase with decreasing resist-ence to the participation sethods.

French, J. R. P., Jr., & Kahn, R. L. A programmatic approach to studying the industrial environment and mental health. Journal of Social Issues, 1962, 18, 1-47.

Present a congruence type theory regarding the effect of the organizational environment on an individual's behavior and level of functioning. Their focus is on presenting an integrated theory of personality and organizations which considers the total person-environment field. The theory builds heavily on the work of Lewin.

The figure below details the major variables and the arrows indicate the major hypotheses of the model.



French and Kahn then proceed to define mental health in terms of this theory. The dufinitions are based on the person-environment fit. The criteria include the following: (1) accuracy of self-concept (congruence self-perception and objective leality), (2) growth, development, and self-actualization (utilization and development of abilities and skills), (1) integration (relationship of roles and compatability of abilities, that, and characteristics), (4) autonomy (extent to which behavior is determined by internal follows or motives and external forces), (5) perception of reality (fit or motives and external forces), (3) greater (4) physicial environment), (6) interpersonal competence, (7) affective states, (8) physicial extense, (9) disease entities, (10) specific criteria of job performance (productivity, quality, rate of promotion, goodiness of fit between the person and the job, and (11) adjustment (coodness of fit between requirements of person and support available to

Priodlander, F. Underlying sources of job satisfaction. Journal of Applied Psychology, 1963, 47, 246-250.

Rocent theories of job satisfaction generally assume 2 underlying types of job elements important to employee satisfaction; those in the work process which allow for self-actualization, and environmental elements in which the worker's rewards are physical and monetary. A parallel assumption pertains to the 2 types of employees for whom each of these is important. A validation of such constructs was attempted through factor analysis and indicated 3 underlying groups of job elements important to job satisfaction: social and technical environment, intrinsic work aspects, and recognition through advancement. The factor of greatest import to each employee was identified, and factored groups of employees were described in terms of their differing sue, salary, and occupational patterns. No significant differences in overall job satisfaction among the 3 groups were found. (M = 600 supervisory and salaried employees)

Priedlander, P. Comparative work value systems. Personnel Psychology, 1965, 18, 1-20, (a).

Categorized a sample of 1468 U.S. Civil Service employses into one of two status levels and one of three occupational
levels. A questionnaire measured relative importance of various work factors. White collar employees considered most
important work characteristics as achievement, challenge, freedom,
self actualization and use of abilities. Blue collar workers
were concerned with the comfort and security factors. Hierarchial
level was significantly related to relative importance of job
security. Decreasing status was associated with job security.
Workers in low status jobs considered job security as most important.

Friedlander, F. Relationships between the importance and the satisfaction of various environmental factors. Journal of Applied Psychology, 1965, 49, 160-164. (b)

Investigated the rolationship between the importance of 73 environmental factors and the satisfaction or dissatisfaction which these elicited for 1939 government employees. Results indicate (a) a V shaped distribution between satisfaction-dissatisfaction and importance; (b) a positive correlation between satisfaction and importance; but a negative correlation between dissatisfaction and importance; and (c) factors of extreme satisfaction or dissetisfaction are more important than mild factors. Pindings support a dual theory of self-actualizing and deficiency motivations.

Friedlander, F. Motivations to work and organizational performance. Journal of Applied Psychology, 1966, 50, 143-152,

Measures of 3 types of motivation to work were related to 2 criteria of job performance, both of which reflect the degree to which the organization has rewarded individual behaviors. In the white-collar sample (S-1,047), which was composed largely of technical personnel, low performers were motivated primarily by the social environment of the job and, to a losser extent, by the opportunity of gaining recognition through advancement, but few significant relationships were found between intrinsic self-actualizing motivations and job performance. In the blue-collar sample (S-421), no significant relationships were found between any of the motivational measures and job performance. With advancing age and tenure, work became more meaningful for high performers but less meaningful for low performers, although the importance of the social environment increased for both high and low performers.

Fryer, M.A., & Zimmerer, T.W. The work environment: Key to greater productivity? <u>Personnel Administrator</u>, 1975, Jan., 38-42.

Comments on dissatisfaction of American workers with dull, repetitive work which leads to high production costs, and social, emotional and political problems. Proposes following work systems as alternatives to the present work environment: (1) work module job rotation (every 2 hours): (2) employee work improvement suggestions system; (3) behavior modification (feedback): (4) job enrichment, work organization, restructuring and the team concept; (5) paternalism-loyalty (corporate concerns). Recommends implementation of several of these work systems into a single environment to enhance productivity.

Fullan, M. Industrial technology and worker integration in the organization. American Sociological Review 1970, 35, 1028-1039.

Reports research results based on a sample of 1491 Canadian manual workers from three different industries - printing, automobile, and oil. These industries were selected to represent three basic types of sociotechnical systems that have been identified in recent literature - craft, mass and continuous process production systems. The main hypothesis is that worker integration in the organization differs by type of sociotechnical system-being highest in the continuous process system, represented by the oil industry and lowest in the mass production system, presented by the automobile industry. Integration is investigated in five areas: (1) relationship with fellow workers, (2) relationship with fellow workers, (2) relationship with follow workers, (2) relationship with first line supervisors, (3) lobor-anangement relations (4) status structure of the organization, and (5) evaluation of the company. The outstanding finding is that the oil worker is much more integrated regarding the above five areas of the organizational system than are auto workers. Printers fall in between, being closer to oil workers than to auto workers. The implications of worker integration in the organization for receptivity toward industrial change and alienation from the job are discussed.

Gadel, M. S., & Kriedt, P. H. Relationships of aptitude, interest, performance, and job satisfaction of IRM operators. Personnel Psychology, 1952, 5, 207-212.

Reports a study on job satisfaction-performance relationship. Sample consisted of 193 IMM operators at an insurance company who operate several different machines, plan their own work and wire control boards. Job satisfaction was measured by a 10 item multiple choice questionnaire covering a variety of attitudes related to work duties. Job performance was a rank order rating of overall job performance made by their immediate supervisor. Aptitude measure - "IMM aptitude"- consisted of Rennett Mechanical Comprehension Test, a test of arithmetic reasoning ability and a letter-digit coding test. Interest measure was developed to differentiate satisfied IMM operators. Significant relationships were found between aptitude and job performance (r=.41) and between interest and job satisfaction (r=.44). Job satisfaction and interest were not related to job performance.

Gagné, R. M. Human functions in systems. In Gagné R. M. (Ed.)
Psychological principles in system development. New York: Holt,
Rineharc and Winston, 196).

Describes human functions in terms of a systems approach. Muman functioning is classified into sensing, identifying, and interpreting. Sensing is a function that requires a difference or change in physical energy as a minimal display condition. Identifying is equivalent to perceiving. Interpreting is the highest level and involves the individual making output responses. Human responses can be unitary [pushing a switch], autonomous (operation of a familiar tool), and flexible (tracking a moving object). Cagné's conceptualization included the concepts of filtering, shunting, long-and short-term memory, models and rules, inventing, and symbolic activity.

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Goiwitz, P.J. Structure of borodon. Journal of Personality assa. Social Psychology, 1966, 2, 592-600.

The human experience of boredom is studied in relation to arousal, constraint, subjective repetitiveness, and unpleasantness. Intense boredom induced by a simple repetitiveness, and unpleasantness be associated with decreased arousal and increased constraint, repetitiveness, and unpleasantness. In an attempt to synthesize boredom, induction of each independent variable by means of past-hypnotic cues indicates significant effects for arousal and constraint but not for repetitiveness and unpleasantness. No single variable is found necessary for boredom although the evidence suggests that normally all 4 fautors are prusent. Implications of findings for current boredom theories are discussed.

The general conclusions supported by the experiments are these: Reported boredom is associated with low arousal, increased feelings of unpleasantness, constraint, and repetitiveness. Boredom can be produced or synthesized by lowering arousal or by increasing one of the other three factors. Each variable tends to redintegrate a complex of all four which, in turn, result in a report of intense boredom. Each alone, however, with the others held constant, can produce boredom, a conclusion unequivocal for lowered arousal and constraint but less certain for unpleasantness and repetitiveness.

Gemmil, G.R., & Heisler, W.J. Fatalism as a factor in managerial job satisfaction, job strain, and mobility. <a href="Personnel Psychology">Personnel Psychology</a>, 1972. <a href="25">25</a>, 241-250.

Explored the relationship between the belief in one's ability to influence the environment and job satisfaction, job strain, and positional mobility. 90 manayers in 3 divisions of a large New York State corporation responded to a questionnaire. The measures used for each of the 4 variables are described and the correlations tabulated. Results indicate that for these Ss the greater the belief in internal control (the ability to influence the environment), the lower is the reported job strain and the higher the job satisfaction and positional mobility. However, belief in either external or internal control may affect situations and behavior in various ways and the study did not test alternative explanations. The direction of causality is not certain; behavior and belief may be mutually reinforcing.

Gibbs, C. B., & Brown, I. D. Increased production from the information incentive in a repetitive task. Medical Research Council Applied Psychological Research Unit. Great Britain, 1955 (Rarch), No. 230.

Ss worked at an uninteresting unskilled, repetitive task of copying pages from reports. In half of the trials, Ss could see a counter which talled each page they completed; on the other half of the trials, they were not given those results on the counter. All subjects were paid uniformly, not supervised, or asked to produce at any rate. Results indicated that shen KR was given on the counter, output was significantly higher than when KR was not given. The increase in productivity was reported to be equal to one extra day's production in every four.

Gibson, C.H. Volvo increases productivity through job envictment. California Management Povice, 1971, 15, 64-66.

Relates some details of job enrichment projects at Volvo Company at its Skovde Engine Plant and Kalmar Assembly Plant. The projects invoive job rotation, job enlargement, team work and the delegation of responsibility to work teams. Groups range in size from 3-9 men. Group is autonomous and takes over many of the prior responsibilities of the foreman.

The Skovde Engine Plant is E shaped with the blocks of the E containing manufacturing departments and the legs of the E assembly and testing department. The Kalmar Plant will cost approximately 11% more than a conventional car plant.

Reports that surveys of employees indicate greater job satisfaction which should increase productivity and quality. Concludes that the increase in productivity should more than offset added costs of training and plant facilities.

Gifford, J.B. Job enlargement. <u>Personnel Administration</u>, 1972, <u>15</u>, 42-45.

Brief review article of concepts, definitions, theoretical and empirical foundations of job enlargement. Defines vertical and herizontal job enlargement and job enrichment. Traces development and history of job enlargement from 1920 - present. Presents job enlargement as a revolt against task specialization that assumes no individual differences, one best way of doing jobs, theory of economic man and efficiency through task specialization. Job enlargement is based on following assumptions: Jobs require more complex utilization of cognitive and motor abilities possessed by workers; jobs have more freedom and responsibility; jobs require greater variety of knowledge and skill; jobs involve entire module of work if feasible. Discusses guidelines for implementation of job enlargement programs.

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Gilbertova, S., & Benes, V. Criteria on evaluation of monotony of work. <u>International Journal of Production Research</u>, 1970, 8, 307-314.

Describes a questionnaire designed to give 7 subjective degrees of monotony with other data concerning characteristics of work. The questionnaire was used in plants with similar technology. Data indicate that (a) the criterion of duration of the operation itself is not sufficient for classification of degrees of monotony; (b) it is necessary to add data concerning the structure of operation; and (c) nontechnical and organizational factors in production, i.e., age, length of time on job, etc., can affect the degree of monotony but are not of primary importance. The subjective aspects of monotony and the opportunity for the employee to change operations are also discussed.

Gilbroth, F. R. Motion study. Princeton, New Jersey: D. Van Nostrand Co., 1911.

Classic book on motion study which involves elimina-tion of unnecessary fatigue, utilizing the time and energy of the human worker to produce the most efficient work and methods to increase the skill level of the worker. Book reports on early studies dealing with bricklaying.

Glaser, E.M. Improving the quality of worklife...and in the progname keyroving productivity. Tochnical Report-Final PB 236 209. Aug., 1974. Human Interaction Research Institute Los Angeles, Calif. Contract boar DB, 92-06-72-27. U.S. Department of Labor, Manpower Administration.

Mireases the complex socioeconomic problem of improving the quality of worklife and, in the process, improving productivity. Focuses on ways to provide a work climate that will stimulate pleasureable ego-involvement in the job, thereby bringing about increased productivity as a likely by-product. Explores a number of attempts to improve the quality of worklife-mamong them job redesign, participative management, and cost-saving sharing. Presents case histories illustrating successful experiences, followed by the author's commonta highlighting possible application to other companies. These include a medical company, Raiser Steel, Tavistock Institute, Shell UK, Donnelly Mirrors, Caines Pet Food, Volvo, City of Redondo Beach, and AT&T. Reviews potential problems and pitfalls attendant upon work improvement programs.

Presents a series of quidelines for introducing a quality of work program, based on generalizations from the above and from works of reputable authorities, followed by an independent set of guidelines and recommendations advanced by the author. Ap-pendices include an outline of an evaluation procedure and a pro-posed supervisory training workshop on improving the quality of worklife.

Gomberg, W. Job matisfaction: Sorting out the nonsense AFL-CIO. American Federationist, 1973, June, 14-19.

Reviews the history of the trade union movement and con-cludes that the unionist have probably done more to eliminate sub human work by raising wages than all of the elaborate schemos of the social scientists. The higher the wage the mo-likely the employer is to seek a capital substitute for the

Reviews experience of merger of Harwood and the Meldon Pajama Company in 1962 and so called success of participative management. Claims that increasing productivity was achieved by weeding out employees who were low producers.

Points out that the success of the General Foods Topeka case was based on the fact that employees were screened for special skills and profiles to match the organization criteria that had been established for the new plant, lout of 10 was selected. Gomberg claims that the Topeka experiment was a stacked experiment in a small plant with conditions set up and controlled to achieve a desired result.

Concludes that the solution does not lie in building new plants in new locations without unions but changing plants suffering from the big city syndrome. More and more workers should participate in the decision making of the enterprise and there should be a new era of cooperation between behavioral scientists enlightened management and trade unionists.

Gomes, L.R., & Mussio, S.J. An application of job enrichment in a civil service setting: A demonstration study. <u>Public Personnel</u> <u>Henagement</u>. 1975, 4, 49-54.

Report of job enrichment project involving 8 female clericals employed by a midwest city personnel department. Enrichment consisted of reorganizing work into a meaningful module, increasing clerks responsibility and recognition and providing new opportunities for achievement and advancement.

Results indicated increased satisfaction with motivation factors on the Minnesota Satisfaction Questionnaire, improvement is job performance as rated by supervisors and no significant change in absencesies.

Goode, C.E. Greater productivity through the organization of work. Personnel Administration, 1964, 27, 34-49.

Theoretical article on work design concludes that the objectives of work design should be to maximize outputs and minimize costs (both economic and human costs). Reviews following work design approaches: job enlargement, job purification, job simplification, and mechanization of routine work.

Finally admits that there has been little experimental re-search to determine the effects of various work design approaches. Innovations are needed in the social rather than technological area. Working organization is best place for this type of re-search. Research is being encouraged by the Department of Budgets in Federal Agencies and Departments.

Gooding, J. It pays to wake up to the blue collar worker. Fortune, 1970, Sept., 133-135,158,162,167-168.

Journalistic review of job enrichment projects at R.G. Barry Co., (Shoe MfG) Columbus, Ohio; Precision Castparts Corp., Portland Oregon Foundry, Corning Glass, Polaroid, Texas Instruments, AT&T, Proctor & Gamble, Donnelly Mirrors Incorporated, and Hon-Linear System.

Gooding, J. The job revolution. New York: Collier Books, 1972.

This book grew out of a series of articles which appeared in Fortune Magazine in 1970 & 1971. The book is based on informal talks with hundreds of workers, foremen, and managers. The following topics are covered in a journalistic manner. (1) the new work ethic - and how it changes the role of the supervisor, (2) polarization between older and younger workers, (3) the relationships between labor, management, government, unions, and workers, (4) the high cost of job dissatisfaction - absenteeism, high turnover, outright sabotage, (5) drug abuse and alcoholism on the job, (6) a forecast of towerrow's working world, and (7) examples of successful job enrichment programs.

Gough, H.G. The assessment of wayward impulse by means of the Personnel Reaction Blank. <u>Personnel Psychology</u>, 1971, 24, 669-677.

The Personnel Reaction Blank was constructed in the hope of providing a quick, reliable approximation of the general factor of impulse control and self-restraint. In occupational settings where dependability and unremitting diligence might be valued, the test has yielded a median correlation of about .10 with ratings of the quality of work. In view of the obvious fact that impulse management is only one of the many factors contributing to the overall quality of work, this coefficient is deemed acceptable as a validity indicator. In support of this view it might be mentioned that in the very successful World War II air crew selection program, the highest single correlation between test and criterion in the battery for bembardiers was .22 (DuBois, 1947). The total prediction of performance was of course based on this one test in concert with six others.

Evidence more directly pertinent to rule-breaking and ruleobservance and to interpersonal behavior was sought. Point-biserial
correlations of .58 and .57 were found for male and fomale samples,
differentiating delinquents from nondelinquents. Employing base
rate assumptions concerning wayward inclinations of three in 10
for sales and two in 10 for females, the optimum cutting score for
both sexes was 27. That is, individuals with scores of 27 and above
should be classified as adequately socialized, and those with scores
of 26 and below as apt to have problems of impulse-control and selfdiscipline. Descriptions of college students by both peers and professionals tended to confirm these diagnostic implications. Highscorers are more often seen as compliant, acquiescent, and ruleaccepting, whereas low-scorers impress others as wayward, ill-tempered,
and under-controlled.

Graen, G. Instrumentality theory of work motivation: Some experimental results and suggested modifications. <u>Journal of Applied Psychology - Monograph</u>, 1969, <u>51</u>, (No. 2, Part 21, 1-25.

Experimental test of instrumentality theory which hypothesizes that a person's attitude toward an outcome depends on his perception of how the outcome is related (instrumental) to the occurrence of other more or less preferred consequences.

Ss were 169 females selected from 203 applicants from a local labor market. Momen were hired on a part time basis with a fictitious company. Simulated tasks were a search task requiring 5s to find certain specific numbers on a computer output matrix rounding task which involved finding numbers on computer printouts and rounding according to rules from six digits to two digits. Performance was measured by quantity and quality. Ss were assigned randemly to 3 treatments: (1) achievement feedback contingent upon effective performance (extra pay for average performance), (3) control (on echievement feedback or extra money). Special instruments were developed to measure the following: (A) perceived attraction of role outcomes (role outcome preferences), (8) perceived instrumentality of work role of a particular job for the attainment of 8 rele outcomes; (achievement, accomplishment, feedback, recognition, responsibility, human relations, and recognition of effective job performance of receiving 8 role outcomes), (C) a measure of perceived expectancy that increased effort would lead to more effective job performance. Overall job satisfaction was measured by Hoppock job setiefaction blank and special measures were developed to arsess degree to which treatment manipulations created intended effects.

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Summary of Results

The results of this may be summarized in the following manner:

1. The procedural checks indicated that Ss in each of the conditions were responsive to the appropriate manipulations. The achievement feedback group showed higher satisfaction than the control group with the role outcomes achievement feedback and recognition, and the money group showed higher satisfaction than the control group with the role outcome of salary. Moreover, the achievement feedback group indicated higher perceived performance than the control group on the criterion tasks.

2. The results clearly confirmed the hypothesis (hypothesis 1) that the consequence of receiving a role outcome following attainment of the role of job incumbent increases the perceived instrumentality of that role for the attainment of like outcomes. The achievement feedback group showed higher instrumentalities than the control group between the role of job incumbent and the role outcomes of achievement feedback, recognition, and human relations. In addition, the money group was higher than the control only on the role outcome of salary.

the money group was anyone of safary.

3. The results concerning Hypothesis II (job incumbent model), considering both the static (raw score) and dynamic (gain score) analyses, support this prediction of overall satisfaction only for analyses, support this prediction of overall satisfaction only for the second of the secon

the group performing in the reciprocating climate (achievement feed-backtgroup) and not for the groups performing in either the prompting climate (money group) or in the control climate (control group).

4. Employing the effective performer model to predict overall satisfaction, aguin considering both attic and dynamic analyses, resulted in significant correlations for primarily the group performing in the reciprocating climate (achievement feedback group) and possibly in the control climate (control group) but not to the present

ing in the reciprocating climate (achievement feedback group) and possibly in the control climate (control group) but not in the prompting elimate (money group).

5. The results regarding Hypothesis III support the prediction that the consequence of receiving a role outcome contingent upon the role of effective performer is to increase the perceived instrumentality between that role and like role outcomes. These data show that instrumentalities were responsive to actual contingencies and were not independent of the organizational climate.

6. The data relevant to Hypothesis IV (effective performer model) predicting job performance support this hypothesis only in the dynamic (gain) analysis and only the group performing in the reciprocating climate (achievement feedback group).

7. In the satisfaction analyses, the differences in results between static (raw score) and dynamic (gain score) enalyses probably reflect the influences of response sets and biases.

Concluded that instrumentality theory shows promise of being a useful model in investigating work motivation if certain boundary conditions are specified. Unless boundary conditions of a theory can be specified, the theory applies under all conditions.

Gruenfeld, S. W., & Foltman, F.F. Relationship among supervisors' integration, satisfaction and acceptance of a technological change. Journal of Applied Psychology, 1967, 51, 74-77.

This study investigated how the integration and satisfaction of supervisors with management affected their acceptance of a technological change. (EDF installation in a steel foundry to process information for accounting, scheduling inventory control and payroll). Attitude questionnaires were administered to 40 first-line supervisors to measure attitude toward the change and several dimensions of integration and satisfaction. The results showed that supervisors who are relatively more integrated with the management group, more satisfied with management, and relatively high in job satisfaction are more likely to accept a management-initiated technological change.

Gruenfeld, L. W., & Weissenberg, P. Field independence and articulation of sources of job satisfaction. <u>Journal of Applied Psychology</u>, 1970, 54, 424-426.

Tested hypothesis that analytical (field independent, PI) and global (field dependent, PD) perceivers would differ in their ability to differentiate among intrinsic and extrinsic sources of job satisfaction. The Ss were 96 civil service supervisors who completed a Group Embedded Pigures Test and the Wernimont job-satisfaction questionnaire. The results showed that for global perceivers intrinsic and extrinsic satisfactions correlated substantially with each other and with overall job satisfaction while for analytical perceivers intrinsic and extrinsic satisfactions were independent and, as expected, only intrinsic satisfaction correlated with overall job satisfaction. Concluded that individual cognitive style is an important variable in the relationship between organizational rewards, job satisfaction and sotivation.

Guest, P. H. Job enlargement, an answer to specialization and boredom? Management Review. 1954, (Aug.) 502-503.

Briefly describes job enlargement program begun in 1943 at IBM. Through enlargement and job rotation pro-grams all of the 7,500 machining and assembly jobs in four U.S. factories have increased in scope. Reports positive aspects of these programs in terms of reduced absenteeism, and higher quality.

Mentions Detroit Edison's study of billing practices in 122 electric utility companies. Cost difference was 40% between specialised departments and non-specialised departments with the non-specialised departments having the lowest costs per oustomer.

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Guest, R. H. A neglected factor in labor turnover. Occupational Psychology, 1955, 29, 217-231. (a)

Reports study of 18 workers who quit their assembly line jobs after 12-15 years on the job. The most important source of job dissatisfaction was related to the nature of work itself. Work pace was completely controlled by the mechanical pacing of the conveyor. Even after years of experience, men never became adjusted to this type of highly rationalized and fractionated work. Workers who remained at these jobs cited this same job characteristic as the primary reason for wanting to leave if the right break came along. Of the 18 men who quit only three went back into factories but not into repetitive conveyor paced work.

Dissatisfactions leading to the decision to quit were compoun by factors of age, physical fatigue, antagonism to foremen, social pressure from wives and family to quit, and being "bumped" into a less desirable job by production cutbacks.

Workers who stayed did so out of fear of taking wage cuts, losing seniority or getting a new job at their ages.

Workers who quit and took other jobs earned less money and had no seniority. They felt in control of their new jobs and more in-dependent with more control over work pace. Concludes that what a man does on an actual job is important.

Guest, R. H. Men and machines: An assemblyline worker looks at his job. <u>Personnel</u>, 1955, <u>31</u>, 496-503. (b)

Considers man in relation to the machine by studying the automobile assembly line from a single interview insofar as this one interview holds true for a
total sample of 400 assembly line workers. In applying the principles of mass production to the extreme,
almost everything that gives work intrinsic value is
gone. Suggestions include more flexibility through
job rotation, more worker participation in planning
this rotation, and job enlargement. Management must
realize that engineering advances and human relations
are interdependent.

Quest, R. H. Job enlargement - a revolution in job design. Personnel Administration, 1957, 20, 9-16.

Briefly comments on early job enlargement projects in machine operations, clerical functions, nursing and insur-ance. Job design emphasis should be shifted to intrinsic mature of work itself and to a fresh approach that does no equate specialization with productivity which devalues work

Hackman, J. R. Effects of task characteristics on group products. <u>Journal of Experimental Social Psychology</u>, 1968, 4, 162-187.

Examined the effects of two task characteristics on written group products, and provided initial steps toward development of a general framework for the description and analysis of "intellective" group tasks. Task variables studied were: task type (production, discussion, and problem solving), and task difficulty. Measures of output characteristics were eight descriptive dimensions. Four hundred and thirty-two products were collected from 108 three-man groups, each of which worked on four different tasks. A total of 108 tasks were used. Task type determined up to 50% of the variance of products on some dimensions. Task difficulty moderately affected product characteristics, and incidental evidence indicated that order of task presentation had little effect on products. To explore further the nature of the differences among the task types, a multiple-discriminant analysis was computed to differentiate among the types in terms of product-dimension scores. Two vectors of discrimination were obtained, and the centroide of the three task types were located in the discriminant space. On the basis of these and other data, the nature of the "task space" within which the three types lie was reconceptualized. The revised "task space" is two-dimensional on onsists of categories of "task cohtents," and the other consists of kinds of "process emphases."

Backhan, J.R. Nature of the task as a determiner of job behavior. Personnel Psychology, 1969, 22, 435-444. (a)

Task factors control up to 50% of variance of behavior and output of small leboratory groups. Presents conceptualization of four classes of variables forming a core of task performance process. (1) characteristics of task or job, (2) hypothesis and intentions the individual develops about how to respond to task, (3) actual work activities or process, (4) outcomes as result of work. Individual characteristics interact with variables 2,3, and 4. Discusses arousal of motives as determined by the task and cognitive and physiological activation.

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Hackman, J.R. Toward understanding the role of tasks in behavioral research. Acta Psychologia, 1969, 31, 97-128. (b)

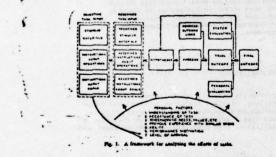
Attempts to lay the ground work for furthering our understanding of the differences among tasks and the ways in which tasks influence behavior. Three general 'problem areas' are reviewed and evaluated in the paper: (a) problems in defining the concept 'task'—i.e., what are the components and characteristics of an adequate task definition; (b) problems relevant to the description of tasks—i.e., what are the most useful and appropriate bases for making task descriptions and comparisons; and (c) problems relevant to understanding task effects—i.e., how do task factors make differences in the ways people think and act.

After evaluating several issues relevant to the problems of task definition and description, one working definition of the concept is proposed.

"A task may be assigned to a person for groups) by an external agent or may be self generated. It consists of a stimulus complex and a set of instructions which specify what is to be done wis a vis the stimuli. The instructions indicate what operations are to be performed by the Ss with respect to the stimuli and/or what goal is to be achieved."

The following general approach to task description is suggested as likely to be most useful in understanding the behavioral impact of tasks. The categories of task description are as follows: dimensions relevant to attimulus saterials, dimensions relevant to instructions about operations, dimensions relevant to instructions about operations, dimensions relevant to of instructions about goals, and dimensions relevant to more than one aspect. (e.g., difficulty level intrinsic interest).

Finally, a frame work is proposed which outlines the diversity of effects which may be attributable to task factors in a performance situation, and suggests how these effects may be conceptualized and related.



Hackman, J.R. On the coming demise of job enrichment. Technical Report 9, December, 1974, Yale University, Contract Konr K00014-678-0097-0026, NR 170-744, Office of Naval Research.

Job enrichment rapidly is becoming one of the most widely used behavioral science strategies for organizational change. And there is scattered but compelling evidence that, under certain conditions, the technique can lead simultaneously to both improved productivity and to an increase in the quality of employee work experiences. Yet observations of on-going job enrichment projects in a number of organizations suggest that the approach is failing in practice at least as often as it is succeeding—and that its future as a strategy for personal and organizational change may be bleak. This report (a) explores a number of frequently-observed errors in implementing job enrichment that can lead to "failures" of the technique, and (b) identifies a number of ingredients found to be common to most of the "success-ful" job enrichment projects that were overved.

The errors in job enrichment include: (1) sometimes the work itself does not actually change, (2) insufficient attention is given to the impact on surrounding work systems. (3) rarely is a systematic diagnosis of target jobs undertaken prior to planning and executing the actual changes, (4) rarely is the work system surrounding the focal job assessed for its readiness for change prior to work redesign, (5) rarely are redesign projects systematically evaluated, (6) neither consulting staffs, line managers or union officers are obtaining appropriate education in the theory strategy and tactics of work redesign, and (7) work redesign projects often are managed by traditional bureaucratic practices. (1) sometimes the work

The following five ingredients are common to successful projects: (1) key individuals responsible for work redesign projects move toward the difficult problems right from the start, (2) a theory-based disgnosis of target jobs is undertaken prior to implementation, (3) specific changes are planned explicitly on the basis of the diagnosis and are done so publicly. (4) contingency plans are prepared shead of time to deal with problems that emerge, and (5) those responsible for the work redesign projects are prepared to evaluate the project continuously throughout its life.

Backman, J.R. Is job enrichment just a fad? <u>Harvard Business</u> <u>Review</u>, 1975, <u>51</u>, 129-138.

Once the wunderkind of the organizational sciences job enrichment is beginning to lose its promise and appeal. More and more organizations are admitting that their work redesign projects have created work systems just as chaotic as the ones they were seant to reorganize. And the same debunking that buried other techniques meant to improve the quality of work is now aimed at job enrichment. Is it job enrichment itself that is at fault? Is the theory wrong to start with? In this article, the author asserts that job enrichment can improve work systems and that the theory is perfectly sound. What is wrong, he writes, is the way most projects are implemented. He lists six qualities unsuccessful projects have in common and five ingredients successful once have. Managers attempting job enrichment in their own organizations will find both lists helpful. (See Hackman, 1974 for details).

Huckman, J.R., & Lawler, E.E. Employee reactions to job characteristics. <u>Journal of Applied Psychology</u>, 1971, <u>35</u>, 259-286.

Developed and tested a conceptual framework specifying the conditions under which jobs will facilitate the development of internal motivation for effective performance. Ss were 62 supervisors and 208 telephone company employees who worked on 13 different jobs. Primary independent variables were (a) a measure of strength of desire for the satisfaction of higher order needs (e.g. obtaining feelings of accomplishment, personal growth); and (b) descriptions of jobs on 4 core dimensions (variety, autonomy, task identity, feedback). It was predicted and found that when jobs are high on the 4 core dimensions, employees who are desirous of higher order need satisfaction tend to have high motivation, high job satisfaction, be absent from work infrequently, and be rated by supervisors as doing high quality work. A number of supplementary analyses are reported.

Hackman, J.R., & Morris, C.G. Group tasks, group interaction process and group performance effectiveness; A review and proposed integration. Advances in Experimental Social Psychology, 1975, 8, 45-99.

Although literally thousands of studies of group performance have been conducted over the last several decades, we still know very little about why some groups are more effective than others. We know even less about what to do to improve the performance of a given group working on a specific task. Moreover, the few general findings that have emerged from the literature do not encourage the use of groups to perform important tasks. Research has shown, for example, that for many tasks the pooled output of noninteracting individuals is better than that of an interacting group. The present paper explores the possibility that the human resources present in groups can, in fact, be harnessed and directed toward more effective performance than would be obtained from individuals alone. The authors suggest that the key to understanding the "group effectiveness problem" is to be found in the on-ging interaction process which takes place among group members while they are working on a task. At one extreme, for example, group members may work together so badly that members do not share with one another uniquely held information that is critical to the problem at hand; in this case, the quality of the group outcome surely will suffer. On the other hand, group members may operate in great harmony, with the comments of one member prompting quick and sometimes innovative responses in another, which then leads a third to see a synthesis between the ideas of the first two, and so on; in this case, a genuinely creative outcome surely.

The challenge is to identify, measure, and change those sepects of group interaction process that contribute to such obvious differences in group effectiveness. This paper is organized into three parts. Section I is a review of existing research, Section II is a proposed framework for research on group effective-

The major functions group interaction serves in enhancing and depressing group effectiveness are explored, and a set of strategies for influencing group interaction and group performance by alteration of 'input' factors is proposed within the new framework. The section closes with an argument for a return to action-oriented research as a way to improve simultaneously our understanding of the determinants of group effectiveness and our capability to change and improve it. Finally, in Section III, implications for research and for action are drawn and explored.

Hackman, J. R., & Oldham, G. R. The job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects. Technical Report No. 4, May, 1974, Yale University, Contract Nonr N00014-67A-0097-0026, MR 170-744, Office of Naval Research. (a)

This report describes the Job Diagnostic Survey (JDS), an instrument designed to measure the following three classes of variables:

1. The objective characteristics of jobs, particularly the degree to which jobs are designed so that they enhance the internal work motivation and the job satisfaction of people who do them.

2. The personal affective reactions of individuals to their jobs and to the broader work setting.

 The readiness of individuals to respond positively to "enriched" jobs--i.e., jobs which have high measured potential for generating internal work motivation.

The JDS is based on a specific theory of how jobs affect employee motivation. It is intended for two general types of use: (a) for diagnosing existing jobs to determine if and how) they sight be re-designed to improve employee productivity and satisfaction; and (b) for evaluating the effect of job changes on employees—whether the changes derive from deliberate 'job enrichment' projects or from naturally-occurring modifications of technology or work systems.

The JDS has gone through three cycles of revision and pre-testing. Reliability and validity data are summarized for 658 employees on 62 different jobs in seven organizations who have responded to the revised instrument.

Two supplementary instruments also are described: (a) a rating form for use by supervisors or outside observers in assessing "target" jobs, and (b) a short form of the JDS. All instruments and scoring keys are appended.

Hackman, J.R., & Oldham, C.R. Motivation through the design of work: Tost of a theory. Fechnical Report 6, December 1974. Yale University, Contract Nonr N00014-67A-0097-0026, MR 170-744. Office of Maval Research. (b)

'A model is proposed that specifies the conditions under which individuals will become internally motivated to perform effectively on their jobs. The model focusses on the interaction among three classes of variables: (a) the psychological states of employees that must be present for internally motivated work behavior to develop: (b) the characteristics of jobs that can create these psychological states; and (c) the attributes of individuals that determine how positively a person will respond to a complex and challenging job. The model was tested for 658 employees who work on 62 different jobs in seven organizations, and results support its validity. A number of special features of the model ase discussed (including its use as a basis for the diagnosis of jobs and the evaluation of job redesign projects), and the model is compared to other theories of job design.

Hackman, J.R., & Oldham, G.R. Development of the Job Diagnostic Survey. <u>Journal of Applied Psychology</u>, 1975, 60, 159-170

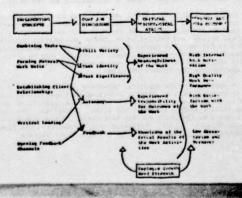
The properties and uses of the Job Diagnostic Survey (JDS) are described. The JDS is intended (a) to diagnose existing jobs to determine if (and how) they might be redesigned to improve employee motivation and productivity, and (b) to evaluate the effects of job changes on employees. The instrument is based on a specific theory of how job design affects work motivation, and provides measures of (a) objective job dimensions, (b) individual psychological states resulting from these dimensions, (c) affective reactions of employees to the job and work setting, and (d) individual growth need strength (interpreted as the readiness of individuals to respond to "enriched" jobs). Reliability and validity data are summarized for 658 employee on 62 different jobs in 7 organizations who have responded to a revised version of the instrument.

Hackman, J. R., Oldham, G., Janson, R., & Purdy, K. A new strategy for job enrichment. Technical Report No. 3, May, 1974, Yale University, Contract Nonr N 00014-67A-0097-0026, NR 170-744, Office of Naval Research.

A new strategy for redesigning jobs to increase the work motivation and satisfaction of employees is described. Included is a statement of the theory on which the strategy is based, discussion of how to carry out and interpret a diagnosis of jobs prior to change, and specification of action steps for job redesign which have been found to lead to beneficial personal and organizational outcomes. The report, which is oriented primarily to managers and behavioral science practitioners in organizations, concludes with a summary of findings from organizational tests of the theory and the change strategy.

Hackman, J.R., Oldham, G., Janson, R., & Purdy, K. A new strategy for job enrichment. <u>California Management Review</u>, 1975, 17, 57-71.

Presents a full model of job enrichment including five implementing concepts. The model is diagrammed below:



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Reports data on job diagnostic survey from 1000 employees working on 100 diverse jobs in 12 organizations. Results indicated that employees with jobs high in motivating potential were higher in internal work motivation, general satisfaction and growth satisfaction, lower in absenteeism and somewhat more effective in performance. Employees with strong growth needs are more positive to jobs high in motivating potential.

Reports on job enrichment project at Travelers Insurance Co. involving 98 keypunch operators and verifiers plus 7 assignment clerks. Job enrichment changes based on the 5 implementing concepts resulted in reducing the number of operators from 98-60. The experimental group showed increase of 19.6% in productivity, control group =8.1% increase. Error rate of experimental group dropped from 1.5% to .9%. By the end of the study the number of operators with poor performance had dropped from 11.1% to 5.5%. The experimental group showed a 25% increase in absence. Experimental group showed a 25% increase in overall satisfaction while the control group showed is .5% increase in overall satisfaction while the control group showed an insignificant .5% improvement. Actual savings in salaries and machine rental charges totalled \$64,305. Potential savings were put at \$91,917 annually.

Hackman, J.R., Weiss, J.A., & Brousseau, K.R. Effect of task performance strategies on group performance effectiveness. Technical Report 5, October 1974. Yale University, Contract Font N00014-67A-0097-0026, NR 170-744, Office of Naval Research

Morms controlling how members deal with performance strategies were altered experimentally in small task-oriented groups [N=144, male undergraduates]. The basic task required assembly of small elsetrical corponents. In one task required assembly of small elsetrical corponents. In one task required assembly of small elsetrical corponents. In one task required to each group member; in another (unequal information was provided to each group member; nanother (unequal information for optimum group performance. In the unequal information condition, an intervention inducing explicit discussion of task performance strategies facilitated group effectiveness. In the equal information condition, effectiveness was enhanced by an intervention that reinforced existing norms against explicit discussion of performance strategies. Spontaneous discussion of strategy did not take place in control groups for either task condition, and control groups were lowest in performance effectiveness. Measures of interaction process and of member reactions to the group were obtained, and were affected substantially by the experimental interventions.

Hackman, R. C. The motivated working adult. New York: American Management Association, 1969.

Presents a theory of work motivation and reports on the design, development and evaluation of a motivational assessment instrument, the Hackman Job Satisfaction Scale.

Hackman proposes a three level developmental hierarchy of motivation. The two lowest levels are the basic physiological drive system and an emotional drive system activated under conditions of threat. The highest level is an intellectual drive system related to stimulation seeking, self-actualization, desires for self expression and environmental mastery. The highest level comes into play as a progressive function of tension reduction at lower levels. Hackman agrees with Herrberg that factors producing job satisfaction are qualitatively different than those producing dissatisfaction are qualitatively different than those producing dissatisfaction. Eliminating sources of dissatisfaction reduces tension but does not motivate performance. What gets particular people to work may be intrinsic or extrinsic depending on their motivational channeling. From a practical standpoint the worker's disposition must be meshed with the circumstances of his work. Clearly highlighted are the interrelations among human characteristics and job properties and supervisory methods.

The theory-suggests ways to reconcile competing views of work motivation.

Rall, D. L., & Lawler, E. E. III Job characteristics and pressures and the organizational integration of professionals.

Administrative Science Quarterly, 1970, 15, 271-281.

Examined job characteristics and three job pressures (quality, time, financial responsibility) as possible correlates of organizational effectiveness and need satisfaction and job involvement of researchers in 22 laboratories.

Main results were that job involvement was significantly related to global technical performance (r.-43). Job challenge and responsibility were linked to positive outcomes. Quality pressure arises from job challenge and is linked to both organizational effectiveness and individual job involvement. Financial pressure arises from responsibility and is related to strong organization performance but not to job involvement.

Job challenge involved working in depth on a small number of projects and not on the total number of jobs or job responsibilities. 'Low' job' challenge was associated with having a wide range of research projects and independent budget accounts.

Job challenge and responsibility for dealing with customers were related to quality pressure and to financial responsibility pressure. Job challenge was also related to need satisfaction. Ounlity pressure, a professional concern, and financial responsibility pressure, an organizational concern, were both related to organizational performance. Quality pressure was slaor related to job involvement, so that this pressure was functional for both the individual and the organization. Financial responsibility pressure was seen as the professional's adaptation to organizational-walues.

Hamner, W.C. and Foster, L.W. Are intrinsic and extrinsic rewards additive: A test of Deci's cognitive evaluation theory of task motivation. Organizational Behavior and Human Performance 1975, 14, 398-415.

Expectancy theory and reinforcement theory of task motivation have assumed that the effect of extrinsic and intrinsic reinforcement are additive in nature. Deci (1971) has recently presented tentative evidence that renortedly shows that contingent monetary reveards actually reduced intrinsic task motivation. This paper re-examines the evidence presented by Deci and then tests his cognitive evaluation theory explanation in both a boring and nonboring task setting. The evidence presented here along with a re-examination of Deci's previous findings indicate that contingent monetary payments that are not delayed have an additive effect with intrinsic rewards on task motivation. The results were discussed in relation to their implication to management.

Bardesty, D., Trumbo, D., & Bevan, W. Influence of knowledge of results on performance in a monitoring task. <u>Perceptual and Motor Skills</u>, 1963. 16, 629-634.

Vigilance performance was tested in six independent groups with a modified version of the Mackworth Clock Test. The groups constituted a 3 x 2 design with (a) no knowledge of results, observer-presented knowledge of results, and machine-presented knowledge of results as one dimension, and (b) physical presence of absence of an observer in the test cubicle as the other variable. All groups were retested without knowledge of results one and seven days after the initial test. On the initial test day, groups with no knowledge of results and machine-presented knowledge of results showed the typical decrement function throughout the session. In contrast, Ss receiving verbal knowledge of results from the experimenter showed less decrement and a significantly higher overall performance. The superiority of the groups receiving the verbal report persisted on the two subsequent test days despite the fact that all extrinsic knowledge of results was withdrawn on these tests. Observer-presented knowledge facilitated performance regardless of the physical presence or absence of the observer is the test cubicle.

Hardin, E. Perceived and actual change in job satisfaction. Journal of applied Psychology, 1965, 49, 163-367.

Analysis of identified questionnaire data collected from 196 office employees at the start and end of a 6-month period showed that change in overall job satisfaction as perceived at the end was a very poor, though statisfaction as perceived at the end was a very poor, though statisfaction as perceived at reports on levels of satisfaction. Perceived change in job satisfaction had zero regression on initial satisfaction but regressed very significantly on terminal satisfaction and on change in 14 job aspects as perceived at the end of the period. The findings cast serious doubts on the usefulness of the quasilongitudinal design in studies of the impact of technological and organisational changes upon job satisfaction.

Marding, D.W. A note on the subdivision of assembly work.

\*\*Rational Institute of Industrial Psychology, 1931, January, 261-264.

Study of two inexperienced workers engaged in soldering wires to wireless sets. Subject A did the main wiring (8 wires, 22 joints). Subject B did the chasels wiring (11 wires, 22 joints) The following week the smaller unit of work was tried: one worker fixed two and the other three wires to each set.

Results indicated boredom with the small task as evidenced by a drop in output at the end of the week. With the small unit of work, speed resched its maximum quickly and then fell off; with the larger unit of work speed was still improving at the end of the week.

The large unit of work allowed steady improvement in quality whereas with the small unit of work the per cent of defects increased toward the end of the week.

Workers preferred the larger unit of work as it was more interesting, time went faster, and they were less tired.

Concludes that extreme simplification of work conduces loss of interest, absent mindedness, and increased susceptibility to distractions.

The state of the s

Harris, D. H., & Chaney, P. B. Human factors in quality assurance. New York: John Wiley & Sons Inc., 1969.

Discusses various means by which managers and others can ensure proper standards of quality in the products manufactured by their companies. Its two objectives are first to provide them with information and ideas and secondly "to provide material useful in the education of professional people such as industrial psychologists, industrial engineers and human factors specialists". It should achieve both. There are chapters entitled the Nature of Industrial Inspection (with ten pages on factors in inspection accuracy), Designing the Inspection Job, Measuring Inspection Performance, Inspection Tools and Techniques and Inspection Selection among others. Each discusses practical mattere, is well illustrated, and ends with a summary and list of references. The practical nature of the book merits a better index.

Harvey, E. Technology and the structure of organizations. <u>American Sociological Review</u>, 1968, 31, 247-259.

Rated 43 industrial manufacturing firms on a number of variables and obtained inter-judge reliabilities on ratings. Results indicated the existence of relationships between an organization's technology and aspects of its internal structure, including the number of specialized sub-units, the number of levels of authority, the ratio of managers and supervisors to total personnel, and the degree of program specification within the organization. A primary finding is that the less changeful an organization's technology, the more likely the foregoing aspects of structure are to increase. The findings hold with size and a number of other organizational variables controlled. The importance of considering technology in the comparative analysis of formal organizations is emphasized. It is also suggested that the technology variable, in connection with other aspects of organizational structure, serves to establish a rudimentary typology of sociotechnical organization and that the use of the typology may provide a useful analytic tool for the investigation of a number of organizational processes, including those of decision-making and patterns of intra-organizational conflict.

Hautaluoma, J.E., & Gavin, J.F. Effects of organizational diagnosis and intervention on blue-collar "blues". <u>Journal of</u> <u>Applied Behavioral Science</u>, 1975, 11, 475-496.

A small midwestern manufacturing company (N=10 managerial, 11 clericals, 48 blue collar-shop employees) suffered excessive turnover among its blue-collar workers in 1972. An organizational diagnosis involving interviews and survey questionnaire assessment of all employees revealed some possible reasons. Several interventions of feedback, supervisory skills training, and process observation were conducted by a team of organizational psychologists; the effects of the interventions are discussed in terms of changes in turnover, reduced absenteeiss, and more positive attitudes toward work, the company, and supervision.

Henderson, J. The compleat worker. <u>Industrial Society</u>, 1970. April, 6-6.

Brief report on N. V. Phillips (Holland) work structuring program for unskilled workers - 1959 to 1970. Program involves additional worker responsibility, decreased supervision of workers, and individual and group participation in planning changes.

Herbst, P.G. Socio-technical design: Strategies in multidisciplinary research. London: Tavistock Publications, 1974.

This book brings together a number of papers, written over the past 19 years, on socio-technical theory, method, and design. Nemetheless, it reads as if the chapters were all written over a short period, with a clear integrative conceptual scheme in mind. There are three parts to the book: (1) design of socio-technical systems, 2) approaches towards the integration of the physical and the relaxional sciences, and (3) characteristics of tasks and organizational structures. The first two parts provide foundations for the third.

Part 1 (Chaps. 1-6) gives a short history of socio-technical design and then moves into the specifics of designing ship organizations. This part is the only section of the book that is grounded in empirical findings, mainly case studies of shipboard organization and surveys of sailors in Norway. But Herbat does not dwell on the methodology of shipboard studies, preferring instead to set out what he feels are the special conditions of ship organization and the organizational forms most appropriate for these conditions.

In contrast to the empirical grounding of Part 1, Part 2 (Chaps. 7-9) is grounded in a conceptual development of operational units defined in terms of the initial state of a system, operations performed on the initial state, and the final state. Merbet sees the operational unit concept as the basis for the integration of the physical and behavioral sciences (p.65). Following this, he analyzes the links arong the coveral disciplines of physical and behavioral science.

Berrick, N. Q. Government approaches to the humanization of work. Vocational Guidance Quarterly, 1975, 24, 169-171.

Describes humanized work as providing the worker with conditions of security, equity, individuation and democracy.

Reviews past and recent government efforts in the humanization of work. Past efforts involve Social Security Act of 1935, Fair Labor Standards Act of 1938, Civil Rights Act of 1964, Manpower Deve ment and Training Act of 1972 and Industrial Relations Act. wer Develop-

Recent efforts involve funding of research projects such as a working conditions survey, by the U.S. Department of Labor. A quality of work program by the National Commission on Productivity and a task force to study work in America.

Concludes that studies indicate that workers are dissatisfied when their work does not give them an opportunity to develop their special abilities, when it is boring and there is no chance for autonomy. The Government is looking at the development of specific programs to humanize work.

Herzberg, F. The motivation-hygiene concept and problems of manpower. Pe,sonnel Administrator, 1964, 27, 3-7.

Review of motivation-hygiene theory of job attitudes and its relationship to manpower problems. Concludes that there is a shortage of talent and that we have developed a system and philosophy to use and motivate this talent that serves to decrease further this precious resource.

Herzberg, F. Mork and the nature of man. New York: World Publishing Co., 1966.

Comprehensive report of interviews conducted in the late 1950's with 200 engineers and accountants. Each interviewe was asked to describe job events which had been of critical importance in making them feel either unusually good or unusually had about some previous job. In describing good job events, respondents more often talked about such things as achievement, recognition, work itself, responsibility, and advancement: in describing bad job events, respondents more often talked about interpersonal relations with superiors and co-workers, technical competence of supervisors, company policies and practices, and working conditions. Since then, similar interviews have been held with, or open-ended question-naires have been administered to, employees from many different countries and in many different jobs; the results have all been essentially the same as those obtained with engineers and accountants, and all these additional investigations and their results are documented and discussed in Work and the Nature of Man. From all this emerged a "general theory" of human work motivation which inpores individual differences and speaks only to human nature in a most general sense. The motivation-hygiene theory holds that certain intripsic or content job features—achievement, recognition, interesting work, responsibility, and opportunity for advancement-can lead to heightened motivation. Moreover, the theory holds that certain extrinsic or context job features—supervision, co-workers, salary, working conditions, and company policies and practices—have potential, in their negative aspects, for producing only lessened motivation will result.

Herzherg, F. One more time: How do you motivate employees? Harvard Business Review, 1968, 12, 53-62.

Reviews failure of extrinsic variables (e.g., wages, fringe benefits) and humanistic innovations in industry (e.g., human relations training, sensitivity training, communications, job participation and employee counseling) in motivating workers.

Outlines motivation-hygiene theory. Sixteen field studies and investigations suggest that the factors involved in producing job satisfaction are separate and distinct from factors that lead to job dissatisfaction. Bygiene factors found in the job environment and based on a workers basic biological drives are related to job dissatisfaction. These hygiene factors include company policy and administration, supervision, work conditions, salary, relationship with peers, and subordinates, status, security, and personal life. Motivating factors that lead to job satisfaction are based on higher needs and drives and are intrinsic to the job content. These factors include achievement, recognition, work itself, responsibility, advancement and growth. Studies have established that of all the factors contributing to job satisfaction, 81% were motivators; of factors contributing to dissatisfaction, 69% involved hygiene factors. Motivation-hygiene theory suggests that work be enriched by manipulating motivating factors. The term job enrichment describes this procedure. The term job enlargement should be avoided because it involves only making s job structurally larger as in horizontal job loading. Vertical job loading involves manipulating motivators. The following chart lists principles of vertical job loading:

Principle
A. Removing some controls while retaining accountability

Motivators involved Responsibility and personal achievement

B. Increasing the accountability of individuals for own work

Responsibility and recognition C. Giving a person a complete natural unit of work (module, division, area, and so on)

Responsibility. achievement, and recognition

Granting additional authority to an employee in his activity; job freedom

Responsibility, achievement, and recognition

B. Making periodic reports directly available to the worker himself rather than to the supervisor

Internal

Introducing new and more difficult tasks not previously handled

Growth and learning

Assigning individuals specific or specialized tasks, enabling them to become experts

Responsibility, growth, and

Reports on a successful job enrichment program involving stockholder correspondents of a large corporation and outlines steps to institute job enrichment programs.

Herzberg, F. Management of motivators. <u>Industry Week</u>, 1971, Feb., 53-54.

General brief review article of concept of job enrichment. Herzberg states that attitudes do not lead to behavior. Behavior leads to attitudes. Attitudes are psychological justifications and rationalizations for behavior. Work behavior is determined by what an individual can do. Motivation is an attitude that justifies behavior that arises from a combination of ability and opportunity. Motivation does not lead to achievement, achievement does lead to motivation. To motivate people on the job select, develop and maximize use of talent. Job enrichment consists of installing motivators in jobs that lack sufficient ingredients for psychological growth. Some motivators are achievement opportunity, responsibility, interesting work and growth opportunity.

Herzberg F., Mausner, B., Peterson, R. O., & Capwell, D. F. Job attitudes: Review of research and opinion. Pittsburgh: Psychological Services of Pittsburgh. 1957.

Integrates seven separate previously privately published studies. The research was undertaken because of a feeling that there is an urgent need for more and better information about the attitudes of people toward their jobs. The studies deal with the characteritistics of dissatisfied workers and factors related to job attitudes, effects of job attitudes, social aspects of the job, supervision and job attitudes, vocational selection and job attitudes, which is industry. Estensive bibliographies are provided for each topic.

Hersberg, F., Hausner, B., & Snyderman, B. The motivation to work. New York: John Wiley & Sons Inc., 1959.

Technical monograph that reports the work experience of some two hundred engineers and accountants from nine firms in the Pittsburgh area studied by a combination of critical incident technique, retrospective patterned interview, and content analysis. The major objective was to identify the factors that lead to positive and negative attitudes toward the job and to study the effects of these attitudes to job performance, turnover, mental health, interpersonal relations and certain general and specific attitudes.

The central question of the study was "whether different kinds of factors were responsible for bringing about job sat-isfaction and job dissatisfaction."

The job satisfied respondents tended to describe factors that were task oriented. Conversely, the job dissatisfied more frequently reported factors involving the job context or surroundings.

The authors adopt an approach-avoidance notion that suggests to them that, in line with their findings, the task factors actuate approach behavior and the context factors encourage avoidance behavior. Their theory is that improvement in the context (or hygiene) factors will remove the impediments to positive job attitudes but will not generate them. In order to develop positive job attitudes, the task factors must be enhanced by restructuring of jobs, selection, supervision and participation.

Hermberg, F. I. & Rafalko, E. A. Efficiency in the military: Culting costs with orthodox job enrichment. <u>Personnel</u>, 1975, 52. (6). 18-48.

(ALC) which began in 1974. Each of center's five directors names a key man who participated in a training session on motivation-hygien and job enrichment. Key man selected pilot projects, served as internal consultants and coordinators of one project. Key man organized two task groups - one for implementation and one for coordination.

Eleven job enrichment projects were fully implemented within 8 months (3 months preparation and planning, 2 months implementation, and 3 months evaluation).

Number of projects were then increased from 11 to 29 and approximately 1000 employees were involved and 260 managers trained in job enrichment.

Pollowing projects were described:

Orthodox Job Enrichment Case Study: Avionice Repair
Ingredients of a
re OJE After OJE Good Job Involved:

After OJE Before OJE Own expertise, learning function Avionics technicians separated into produc-tion line and flight Consolidation of flight line and one-third of production line technicians flight line groups Each avionics tech-nician handles own defects Personal account-ability, responsibility for work Plight line group cor-rected all avionics defects Each avionics tech-nician works with pilot testing his aircraft Only flight line Direct feedback client relationship group communicates with pilots with pilot Savings = 85,648

Hickson, D.J., Pugh, D.S., & Pheysey, D.C. Operations technology and organization structure: An empirical reappraisal. Administrative Science Quarterly, 1968, 14, 378-397.

Proposes a classification of concepts of technology as operations technology, materials technology, and knowledge technology. The construction of scales measuring operations technology at an organizational level of conceptualization, makes it possible to test the broad hypothesis that organizational technology is strongly related to organizational structure, by linear and nonlinear correlational analysis. On a stratified sample of diverse organizations in the English midlands, and on a subset of manufacturing organizations, this sweeping "technological imperative" hypothesis was generally not supported in successive tests. Operations technology was, however, associated with some variables, which are similar in that all were job-counts denoting the proportions employed in specified categories. This result, together with a detailed comparison with Moodward's findings in south-east Essex, leads to a reinterpretation of the role of technology. Operations technology is shown to affect only those structural variables immediately impinged on by the workflow. Thus the smaller the organization, the more completely its structure is pervaded by the immediate effects of this technology; the larger the organization, the more these effects are confined to variables such as the proportions employed in activities that are specifically linked with workflow, and technology is not related to the wider administrative and hierarchical structure. This interpretation, it is suggested, offers a synthesis for the long-standing divergence in organization theory between statements by classical management vriters of management principles irrespective of technology, and the stress by behavioral scientists on the relevance of technology.

Hill, A. R. The measurement of work variety. The International Journal of Production Research, 1969, 8 (1), 25-39.

The work reported in this paper has treated work variety as a sphjective variable rather than an objective attribute of work. A measure of perceived variety associated with work occurring within a defined period of time (a week), was established by applying a psychophysical scaling technique to a physical measure of work structure. The most appropriate measure of work structure. The most appropriate measure of work structure was found to be the entropy of the total set of tasks occurring within a week, a modified version of the Shannon-Winner measure of stropy being used. A quadratic function was found to describe quite adequately the relationship between perceived variety and entropy in the case of groups of operators, and also in the case of seven out of ten individuals. In the three deviant cases, a virtually linear relationship was discovered.

. No acceptable explanation can be offered, on the basis of the evidence currently available, to account for these three cases. As a matter of speculation, however, it may not be without significance that these subjects had somewhat shorter lengths of service than their seven colleagues, which suggests that the results may be a function of the digree of adaptation to the work. Further investigations will be necessary to evaluate this proposition and also to examine the role of personality factors in the perception of variety.

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Another point which requires further investigation is the variation in the maximum value of the seven parabolic curves. The height of the curve is a reflection of the amount of psychological space occupied by the stimuli, and again it is possible that with increasing adaptation, this space will contract and the height of the curves correspondingly diminish. When the entropy measure of perceived variety was applied to examine the relationship between variety and work performance, a null finding was obtained, which suggested that variety, per se, has no effect upon performance.

It is possible that the role of variety in determining work performance is similar to that of intelligence in determining susceptibility to monotony. Intelligence alone is unrelated to feelings of monotony, but combined with other factors, itoperated as a suppression variable in a multiple regression predictor. Similarly, perceived variety, taken together with other variables, for example degree of task difficulty challenge, degree of interest in the work, etc., may be more effective as a predictor of performance. Research along these lines is proceeding.

Hill, A.B. Extraversion and variety seeking in a monotonous task. British Journal of Psychology, 1975, 66, 9-13.

It is hypothesized on the basis of Fymenck's theory of extraversion that extraverts should build more variety into their performance at a monotonous task putting pins in a sheet, than introverts. The performance of a group of extraverts (N=1c) and a group of introverts (N=1c) on a simple repetitive task was compared. Comparisons were made on two measures of response variety: firstly, a simple measure of number of alternations among possible responses and, secondly, a measure of variety taken from information theory-the average entropy of the set of responses made. The hypothesis was confirmed on both measures. The results are interpreted as adding further support to Eylenck's work linking differences in extraversion to differences in arousal.

Extraverts require more external stimulation than introverts to maintain an optimal level of cortical arousal. Extraverts build more variety into their responses on a monotonous task and there was an increase in mean response variety over the course of the experiment.

Bill, A. B., & Thickett, J. M. P. Batch size, cycle time and setting time as determinants of productivity in skilled machining work. Occupational Psychology, 1966, 40, 83-89.

Analyzed weekly work sheets for a six month period of 16 men in a milling section of a manufacturing firm producing components for specialized packaging equipment. All were experienced millers paid on flat rate plus bonus. Work sheets contained details of batch size, cycle time, and setting time (actual and allowed time). Time allowances were set and were considered accurate enough to form the basis of a performance measure. The criterion adopted was the percentage time saved on each job (% time saved = 100x(total time allowed-total time taken)

Total Time Allowed

For each of the 16 Ss multiple regression analysis was made of % time saved in relation to batch size, cycle time, and setting time. The results indicated some support for setting time and to a lesser extent cycle time. As determinants of productivity, the longer the cycle time or setting time, the higher will be individual's productivity in terms of % time saved. Interpretation of results may be that a longer cycle of work presents greater variety and task difficulty to the worker. A second finding was that batch size was not related to productivity.

Hill, P. Towards a new philosophy of management: The company development programme of Shell U. K. Limited. London: Gower Press, 1971.

Report of a case study on a grand scale. It deals with a subsidary company which ran British oil refineries and which during the study became a part of Shell UK Limited. The Company had been plaqued by poor industrial relations, restrictive practices and low productivity. A small team led by Paul Hill diagnosed the problem as one of motivation. Nembers of Tavistock Institute staff joined the small team and the outcome was a long term program based on a draft statement of company objectives and philosophy, which was discussed and modified at a series of conferences starting at the top of the company and working downwards. Actions taken included productivity agreements, tob enrichment, more flexible organizational structure, new staff appraisal systems, and management by objectives.

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Hinrichs, J. R. A replicated study of job satisfaction dimensions. <u>Personnel Psychology</u>, 1968, <u>21</u>, 479-503.

Investigated through factor analysis of attitude survey data the most prevalent patterns of job attitudes using a diverse sumple of 1650 exployees engaged in support functions for a large national marketing organization. A questionnaire of 60 items that asked respondent to rate degree of satisfaction with some component of employment relationship were factor analyzed using a bi-quartism rotation, sample was divided into subpopulations on basis of managerial and position level. Nine factors were extracted: (1) work itself (2) job demands (3) management (4) pay (5) future (6) company (7) associates (8) obstacles (9) security. Factor structure of each of five differing subpopulations of employees was comparable. Multiple correlation of roughly .70 were found hetween the nine attitude factors and a single rating of overall satisfaction. Attitudes about the company in general and about the work itself comprised the major share of overall satisfaction variance. Pay factor made a relatively strong contribution to overall satisfaction for five subpopulations both in terms of direct correlations and unique common variance. Some sex differences and subpopulation differences were reported.

Hinrichs, J. R. Ability correlates in learning a psychocotor task. Journal of Applied Psychology, 1970, 54, 56-64. (a)

Replication study designed to observe presence of increasing and decreasing task specific factors in rotary pursuit skill acquisition. Study also identified different abilities related to early and late stages of practice and determined effects of two different methods of approaching the task. Ss (50 college students) completed a series of reference tests and were randomly assigned to Group I (training emphasized accuracy) or Group II (training emphasized accuracy) or Group II (training emphasized speed). Reference tests and performance tests were factor analyzed by principal axis varimax method. Factor 1 (speed) is an increasing task specific factor and none of the reference tests were related to this factor. Factor 2 (accuracy) is a decreasing task specific factor and is most related to accuracy pre-test. Factor 3 is a composite of three reference tests (two pop board scores and a coordination test).

A comparison of ability correlates of proficiency at various stages of practice for a group in which tracking seed was emphasized suggests that differences in method of approaching the task may be responsible for much of the task-specific factor variance. The results highlight the difficulties in predicting proficiency in motor tasks from basic ability measures and the significantly greater utility of job samples for predictive purposes.

Binrichs, J. R. Psychology of men at work. Annual Review of Psychology, 1970, 21, 519-554. (b)

Reviews the research literature in industrial and organizational psychology between 1967-1969, with the exception of selection research. The presentation is organized in 3 major areas: (a) job content and contextual factors comprising the work environment, including task characteristics, the occupational role, leadership, communications, and rewards systems; (b) individual characteristics of ability, personality, motivation (needs, goals, expectancies, job attitudes); and (c) specific personnel management topics of industrial training, employment of minority groups, assessment, turnover, safety, and accidents, labor relations, and research methods and techniques. It is concluded that although there has been significant progress toward the development and testing of theory, there is a need for more longitudinal research designs, standardization in research designs and instruments, and concern with research on socially relevant issues.

Rulin, C.L. Effects of changes in job satisfaction levels on employee turnover. <u>Journal of Applied Psychology</u>, 1968, <u>52</u>, 122-126.

The results of a program designed to increase the job satisfaction and decrease the turnover rate among a large group of female clerical workers are presented. Results indicated that levels of satisfaction were increased with the largest increases occurring in the satisfaction variables stressed in the program. A significant decrease in turnover (from Now to 12%) was also observed. Several alternative explanations for increased satisfaction and decreased turnover were considered, due to the lack of a completely adequate control group. None was considered adequate to explain the particular pattern of results obtained.

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Hrebiniak, L.G. Job technology, supervision and work-group structure. <u>Administrative Science Quarterly</u>, 1974, 19. 395-405.

The relationship between technology and structure at the individual level was found too weak to indicate a technological imperative, even controlling for the prior accimilization or background of respondents. At the group level of analysis, variables such as the perceived hierarchical independence and decisional participation of the supervisor were significantly related to structure, independent of job technology. With the effects of supervision taken into account, job technology and work-group structure aboved significant relationships. Results of multivariate analysis indicated the importance of both technology and supervision for work-group structure. The data suggest that a number of variables account for structure in organizations where control is fragmented.

Hulin, C.L. Effects of community characteristics on measures of job satisfaction. <u>Journal of Applied Psychology</u>, 1966, 50, 185-192. (a)

Gathered data concerning various aspects of ferale clerical worker's job satisfaction and group productivity from the employees of 300 catalog order establishments. Measures were also obtained of the prosperity, unemployment, slums, preductive farmine, and decrepitude of the communities in which the catalog order establishments were located. Analysis of these data indicated: (a) average satisfaction scores and group productivity were unrelated in general, (b) satisfaction scores were negatively related to the prosperity of the community, and (c) pay satisfaction scores tended to be more negatively related to the prosperity of the community than did the other aspects of job satisfaction. An explanation of these findings in terms of frames of reference and alternatives available to the workers is offered.

Rolin, C.L. Job satisfaction and turnover in a female clerical population. <u>Journal of Applied Psychology</u>, 1966, 50, 280-285, (b)

Job-satisfaction questionnaires were administered to a sample of 350 female clerical workern employed by a large firm located in Montreal. After a lapse 67 5 mo. 31 girls had quit, 26 of whom had completed the questionnaire. These 26 girls reported significantly less satisfaction with their jobs than the 319 girls who remained on the job. An explanation of this finding in terms of the difficulty of finding a new job, economic pressures to remain on present job, and condition of the labor market in Montreal is offered. The relationship between satisfaction and turnover is not regarded as general. The study was continued for 7 hore monindicate that job-satisfaction scores continue to exhibit a significant relationship to turnover over a 12-mo. period. Even after a 12-mo. period the terminators had reported lower job satisfaction at the time of the assessment than those who were still with the company.

Hulin, C. L. Sources of variation in job and life satisfaction: The role of community and job-related variables. <u>Journal of Applied Psychology</u>, 1969, 51, 279-291.

Tested several hypotheses relevant to the analysis of the effects of community characteristics on job satisfaction. The Se were 190 male and 80 ferale white-collar workers employed by the same company and living in two company towns in Canada. Town A had complete medical, educational, and recreational facilities and a population of 10,000. Town B had a population of 200 with limited facilities, but relatively inexpensive company housing. The subjects completed the Job Description Index (JDI), satisfaction with job in general (JIG), life in general (LIJ), and rated the facilities and features of their communities on a five point satisfaction scale.

Results indicated that differences between communities result in predictable differences in the worker's satisfaction with these communities. These same community characteristics which result in difference in their satisfaction with the cost of living in the community also have a significant effect on their satisfaction with pay.

Secondly, it was demonstrated that the worker's satisfaction with the economic characteristics of the community had the expected effect on their satisfaction with pay. Thirdly, it was demonstrated that the worker's satisfaction with pay. Thirdly, it was demonstrated that the worker's satisfaction with community characteristics and satisfaction with job characteristics considered jointly had significant and predicted effects on their satisfaction with their JIO. Finally differences between male and female workers in terms of the variables which were related to overall job and life satisfaction where related to overall job and life satisfaction were reasonable. The magnitude of multiple correlations predicting general job satisfaction from community and specific job satisfaction variables were not only significant but were substantially large. For males, the eight predictor variables controlled approximately 3% of the variance in job satisfaction and for the females, the seven predictor variables accounted for approximately 4% of the variance. Therefore, not only are the relationships statistically significant, but they are large enough to be considered as plactically significant.

Hulin, C. L. Communications: Morker background and job satisstaction: Reply. <u>Industrial and Labor Relations Review</u>, 1973, 26. 853-855.

Reply to a research study completed by Schuler (1973). Findin states that while different labels have been used to explain the data from Turner & Lawrence (1965), Blood & Hulin (1967) and Hackman & Lawler (1971) the three sets of data are consistent as some workers resoond unfavorably to high level skilled jobs and that these workers tend to come from urbanized areas. Shepard (1970, 1973) and Schuler (1973) obtain negative results when they use area of socialization rather than present docation of the worker.

Hulin, C. L., & Blood, M. R. Job enlargement, individual differences, and worker responses. Psychological Bulletin, 1968, 60, 41-55.

Reviews traditional theory of the effect of specialized jobs on performance. Theory is diagrammed as follows:

Stimulus condition Perception Affective Behaviora Response Response

Simplified
low skill
level, short -> Monotony -> Boredon

Job enrichment is defined as process of allowing individual workers to determine their own working pace, to serve as their own inspectors by giving them responsibility for quality control, to repair their own mistakes, to be responsible for their own machine setup and repair. Job enrichment involes higher skill jobs, varied work content and relative autonomy for the worker.

Empirical evidence linking job satisfaction to job size is reviewed. Most studies have generally been poorly controlled and the data is limited. Evidence is also reviewed concerning the hypothesized relationships between repetition and monotony, monotony and satisfaction and satisfaction and behavior.

Concludes that the case for job enrichment has been drastically overstated. They agree that the job entarcement hyperthesis may predict the behavior of white collar workers and rural or small town blue-collar workers. The relationship between job size and job satisfaction cannot be assumed to be general, but rather is dependent to a great extent on the hackgrounds of the workers in the sample. A model which relates job size to satisfaction depending on a third variable fallenation of the workers from middle class work-related values and norms) is presented. This model according to the authors adequately accounts for problems and contradictions which exist in the literature.

Huse E.F., & Beer, M. Eclectic approach to organizational development. <u>Marvard Business Peylow</u>, 1971, Sept./oct., 103-112.

Report of job redesign project at a small plant which manufactured a variety of electrical and electronic instruments for medical and laboratory use. Project involved changing the structure of the job to provide individual workers with more responsibility for planning, doiry, and evaluating their own work; the creation of autonomous work teams and the principle of integrators which are used to bring together more closely work groups with differing qoals(e.g. marketing and plant engineering). Results of job redesign project are as follows:

	Hot Plate Department	Glass Shop	Total Program
Productivity	+84%	+20%	+17%
Quality	prop in re- jects from 27% - 1%	No Data	+50%
Absentceism	propped from	No Data	Reduced by

Concludes that OD project was an unqualified success that resulted in greater efficiency, profit and decreased voluntary turnover.

Huse, E. F., & Price, P. S. Relationship between raturity and motivation in varied work groups. Proceedings of the 18th Annual Convention of the American Psychological Associlation, 1970, 5, 587-588.

Investigated relationship between maturity as ressured by a self actualization form and motivation is upervisor. ranking) in five work groups representing a partial continuum between McGregor's Theory X & Y. Group A was corposed of 34 college graduate computer programmers. Group P-17 fermal ansembly workers in an enlarged complex electronic job. Group C-9 female glass workers with partially enlarged jobs. Jorup D-11 female assembly workers on a varied job. Group F-7 female assemblers on a routine specialized task. Rank order correlations between motivation and maturity in each group B-11 female assemblers on a routine specialized task. Rank order correlations between motivation and maturity in each group supported hypotheses that as an organization approaches Theory Y, mature workers are more highly motivated and immature workers are more highly motivated and immature workers are more highly rotivated. It was also found that factory workers in enlarged rebs and who had been involved in organizational development did not differ significantly from the college graduates as measured by the difference in r between motivation and self-actualization.

Inkson, J. R. K., Hickson, D. J., & Pugh, D. S. Administrative reduction of variance in organization and behavior: A comparative study. Paper presented at The Annual Conference of The British Psychological Society, 1968.

Examination of effects of structuring of activities and concentration of authority on roles and behavior of senior executives. Study of 40 senior executives showed that administrative factors in structured and/or concentrated authority organizations reduce the amount of variance in roles, and thus the amount of innovation and flexibility encouraged in interpersonal relations, and conflict. The conclusion, surprisingly, is that in highly structured organizations, executives experience less routine, and hold mutual expectations of innovative activities. Conflict is associated with definition, when executives responsibilities are less clear, conflict ensues.

Inkson, J. H. K., Pugh, D. S., 4 Hickson, D. J. Organization context and structure. An abbreviated replication. Administrative Science Quarterly 1970, 15, 318-329.

Established the reliability and validity of short forms for the measurement of four previously established dimensions of organizations: two contextual-technology and dependence-and two structural-structuring of activities and concentration of authority-based on information obtained from the chief executive in an interview lasting about one hour. A replication ruly was carried out using the abbreviated measures on a sample of 40 organizations in the English Hidlands. The findings supported the relationships previously found between context and structure. Structuring of activities was found to be primarily related to organization size and to a lesser extent to technology; concentration of authority was found to be related to dependence. A rostudy using those measures on 14 organizations after a period of four to five years generally supported the hypothesis that forms of workflow bureaucracy show a trend over time in the direction of increased structuring of activities coupled with decreased concentration of authority.

Iris, B. & Barrett G.V. Some relations between job and life satisfaction and job importance. <u>Journal of Applied Psychology</u>, 1972, 56, 301-304.

Conducted a study with 2 groups of male foremen in a chemical plant identified by management as having low morale (n=34) or a relatively higher level of job satisfaction (n=35). So were given the Job Descriptive Index and questionnaires concerning satisfaction with life in general, the degree of importance attached to each job aspect, and demographic data.

Results indicated that low morale foremen were younger, attached more importance to promotion and pay and were less satisfied with pay, promotion, co-workers, supervision life in general and leisure.

The results supported a spillover interpretation of the relationship between job and life satisfaction. The relationship between satisfaction and pay was moderated by the favorability of the job situation. The concept of job importance was of value in understanding the interrelationship between job and life satisfaction.

James, L.R., & Jones A.P. Organizational climate: A review of theory and research. <u>Psychological Bulletin</u>, 1974, <u>81</u>, 1096-1112.

Previous organizational climate research, definitions, and measurement approaches are roviewed and differentiated into three categories, namely, a multiple measurement-organizational attribute approach, a perceptual measurement-individual attribute approach, and a perceptual measurement-individual attribute approach. Similarities and differences between these approaches are discussed in an attempt to address a number of theoretical and psychometric concerns. A major focus is the extent to which organizational climate duplicates other organizational and individual domains. Recommendations are made for future research which include a rationale for differentiating between organizational climate and psychological or individual climate and an emphasis upon the distinction between level of measurement and level of explanation as related to future definitions of climate.

Jausen, R. Job enrichment: Challenge of the 70's. Training and Development Journal, 1970, 24, 7-9.

Discusses problem that the number of young people employed are increasing, job tenure is decreasing, especially among the young, and past work motivation achemes have failed. It is suggested that "it is the work itself that might be the problem and the key to job satisfaction." Several programs to restructure jobs to make them more challenging and satisfying are mentioned. Aspects of job enrichment include achievement, responsibility, growth, and learning.

Jenkins, G.P., Jr., Radler, D.A., Lawler, E.E., & Cammann, C. Standardized observations: An approach to measuring the nature of jobs. <u>Journal of Applied Psychology</u>, 1975, 60, 171-181.

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In an effort to determine the usefulness of standardized job observations, 35 observers were trained to observe the characteristics of jobs. Employees (N-448) were observed for 2 hours and were also interviewed. The observation measures were assessed to determine if they possessed repeatability, homogeneity, and convergence. Of the 19 job dimensions studied. Il demonstrated repeatability and homogeneity. Six of the dimensions were rested for convergence with the interview data, and foir showed moderate convergence. It was concluded that job observations are a potentially useful way to measure the characteristics of jobs, but that they have significant limitations.

Johnston, W. A., & Briggs, G. E. Team performance as a function of team arrangement and work load. <u>Journal of Applied</u> Psychology, 1968, 52, 89-94.

Studied effects of work load and team work arrangement on a simulated task. Pairs of Ss (N=64 male college students) served as radar controllers in a simulated approach-control task, and they were required to alternate in directing aircraft syptroaches. Prescribed approach rate was 1 approach every min. (high work load) or every 2 min. (low work load) S could compensate for his partner's early or late approaches in corpensatory teams but not in noncompensatory teams. Each team completed 4 experimental sessions. Standardized algebraic average of approach times was closer to criterion in compensatory teams than in non-compensatory teams, particularly under low load. Under high load, fewer flight errors occurred in compensatory teams than in non-compensatory teams. Team communication inhibited team performance only in the mon-compensatory high-load condition. It was concluded that some team functions hinder, others enhance, team output.

Jordan, N. Allocation of functions between man and machines in automated systems. Journal of Applied Psychology, 1961, 47, 161-165.

With the growing complexity of the man-machine systems the problem of allocation becomes more critical. Little progress has been made towards it solution since the publication of Pitts' article in 1951 which has does instead thinking in this area. Fitts pecommended that man be compared to machines and be chosen for those functions which he does better than machines and vice versa. To do so is wrong; when we can compare a man to a machine, we find that we can also build a machine for the function involved. Hence the lack of progress. Men and machines are complementary, rather than comparable. Once the problem is so reformulated, new ways of thinking which appear to be promising open up.

 Pitts, P. M. (Ed.) Human engineering for an effective air navigation and traffic control system. Washington, D.C. National espearch Council, 1951.

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Kahn, R. L. The work module -- a tonic for lunchpail lassitude. Paychology Today, 1573 (February), 15-19, 94-95.

Proposes a work module approach to fit the job to the individual. A work module is a time tack unit which is usually the smallest allocation of time that is emonemically and psychologically meaningful (usually two hours). Occupations in which workers make their own jobs are usually high in intrinsic job satisfaction. This is true of professional and business occupations. The work module experiment is designed to extend this job freedom to workers at the bottom of the occupational hierarchy without disadvantage in organizational effectiveness.

Kahn advocates the goodness of fit between the characteristics of the person and the characteristics of the environment as a further aid in the humanization of work.

Kaplan, H.R. Communications: How do workers view their work in America? Monthly Labor Review 1973, 96, 46-48.

Critical comment on Work in America report. Questions two assumptions of the task force report. (1) Do all people seek greater opportunities for creativity and responsibility in their job or do some people prefer economic rewards (2) are a size-able number of American workers dissatisfied with their jobs? Reports data from Gallup polls which shows that job satisfaction actually increased over the last two decades for both white and black workers.

Presents evidence of a commitment to work throughout the U.S. across different occupations, socioeconomic groups and time.

Concludes that recent research indicates the following:

- Workers desire more control in their work routines, but still expect management to manage. A major study of 65 organizations found little difference between the amount of control workers wanted and the existing distribution of control in their organizations.
- Men employed in bureaucratic organizations tend to be more intellectually flexible and more open to new experiences, are more self-directed in their values, and have greater self-esteem than men who work in nonbureaucratic organizations.
- Job complexity has an effect on psychological functioning, but it may be perceived and interpreted differently by workers as being important or unimportant.
- While there are pockets of dissatisfaction, and perhaps alienation, among segments of the labor force, the majority of workers appear to be satisfied with their jobs.
- 5. Studies in the United States and abroad on alienation from work, job complexity, and technology indicate that while there may be some negative effects associated with these variables in the workplace, there is little evidence to support the contention that negative work experiences are carried beyond the workplace and are transferred into generalized feelings of alienation and anomie.

1 Work in America: Report of a special task force to the SEC of Health, Education and Welfare, Cambridge, Mass: MIT Press 1973.

Kaplan, H.R., Tausky, C., & Bolaria, B.S. Job enrichment. Personnel Journal. 1969, 48, 791-798.

Brief review of studies involved with motivation-hygiene theory. The majority of studies that support the theory used a similar methodology to the original Horzberg study (17 out of 21 confirming studies). Of the 18 disconfirming studies, 15 employed different methodological approaches.

Discusses role of individual differences in workers response to job enrichment including occupational level, social class, motivational differences, and effects of informal work group

Concludes that management might be wise to accept reality that all jobs do not lend themselves to enrichment. Proponents of job enrichment have reglected diverse factors which act upon individuals and groups of workers that significantly affoct worker motivation and response to job enrichment.

Kaplan, R.E. Managing interpersonal relations in task group: A study of two contrasting strategies. Technical Report 2, November 1973. Yale University, Contract Nenr N00014-67A-0097-0026, NR 170-744, Office of Naval Res

This report compares the effects of two types of group maintenance on group performance effectiveness and group member experiences. Group maintenance is defined as the way in which interactions among individuals in a group are managed. The two popular types of maintenance examined in the research are: (a) traditional emintenance, distinguished primarily by the strategy of coping with interpersonal issues in the group through supression, and (b) adaptive maintenance, characterized by the strategy of giving public and direct attention to the interpersonal and emotional phenomena in the group.

Two general hypotheses were proposed: (a) adaptive maintenance results in a more fruitful (if more taxing) experience for group members, and (b) adaptive maintenance leads to superior task performance. These hypotheses were tested in a laboratory experiment in which four-person mixed-sex dyads worked on a series of humon-relations problems over a four-hour period. The two types of group maintenance were experimentally induced (N=108 undergraduate students).

Results were mixed. Hypothesis (a) about the comparative experience of group members in the two conditions was confirmed. Bypothesis (b) that adaptively maintained groups would perform better was not supported: adaptively maintained groups performed more poorly than traditionally maintained groups. Several interpretations of the unexpected performance effect were proposed and explored.

Rasi, S. V., & Cobb, S. Some psychological factors associated with illness behavior and selected illnesses. <u>Journal of Chronic Disease</u>, 1964, 17, 325-345.

Studies data from company medical and personnel records covering a two-year period of 331 male employees of
a large research laboratory. Physical exams, medical interviews, test and questionnaire data, and dispensary
visits were also variables in the study. Results did not
confirm findings of earlier research that showed dispensary visits to be inversely related to occupational status.
Nild support was found for the hypothesis that when the
effects of job status are held constant, the men on the
more frustrating job would have more dispensary visits.

Kasl, S. V., & French, J. R. F., Jr. The effects of occupational status on physical and mental health. <u>Journal</u> of <u>Social Issues</u>, 1962, <u>18</u>, 67-87.

Reports on medical data of employees of two companies drawn from company records of dispensary visits. Hedical records covered up to 35 possible diagnostic categories and spanned a 24 year period. Total N-apx 6,000 blue collar workers, foreman and supervisors. In both companies, job skill level was inversely related to dispensary visits. Among craft jobs, higher skill jobs were associated with fewer dispensary visits. Foremen supervising high skill craft jobs had fewer visits than foremen supervising low-skill craft jobs. Results of a questionnaire given to four foremen and 29 craftsmon indicated that objective status of one's job is related to self-esteem and self-esteem was inversely related to medical visits. An additional finding was that perceived monotony and duliness of one's job was associated with more frequent dispensary visits.

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Katsell, R., Perrett, R. S., & Parker, T. S. Job satisfaction, job performance, and situational characteristics. <u>Journal of Applied Psychology</u>, 1961, 42, 65-72.

Studied relationship between employee job satisfaction and performance, through a research design that conceived of these variables as outputs of a system having as inputs the characteristics of the work situation. Data on employee job satisfaction, job performance, and situational characteristics were obtained in 72 comparable, geographically decentralized warehousing divisions of a company. These data were intercorrelated, using the division as the unit of analysis. The major findings include:

- Job performance is not a homogeneous characteristic.
   Measures of quantity of production per man-hour and profitability are intercorrelated, but quality of production and turnover are each essentially independent of the other performance measures.
- 2. Employer job satisfactions, as measured by questionnaire items, are significantly greater in those divictions which turn out the greater quantity of production per man-hour and which are more profitable. Job satisfactions are significantly associated neither with turnover nor quality of production, as measured here.
- J. Five situational variables are intercorrelated and may be represented by a general centroid factor characterized as urban vs. small town culture. These variables include community size, number of employees in the division, union representation, average wage rate, and proportion of employees who are male.
- 4. Divisions whose situational characteristics are in the direction of the small town culture pattern typically have greater employee job satisfaction and superior job performance (in terms of quantity of production and profitability); there is some trend for such divisions also to have lower rates of turnover.
- 5. Their correlational nature makes the results amenable to more than one interpretation. The one preferred by the investigators regards the situational characteristics as independent variables, with job satisfaction and performance as dependent variables which are correlated because each is a function of the same situational characteristics; employee needs and expectations are postulated as variables intervening between the situational and both the satisfaction and performance variables.

Ratzell, R.A., Yackelovich, D., & Others. Work, productivity, and job satisfaction: An evaluation of jolicy-related research.

New York: The Psychological Corporation, 1975,

Evaluation of research dealing with features of work which affect both the productivity and job satisfaction of employees.

Although it was found that such research falls short of what is required for firm conclusions, certain convergent findings suggest direction for future policies. These include:

- Relatively limited programs, such as job enrichment, participation in decision-making, or incentive pay plane, seem unlikely by themselves to create large or enduring improvements in both productivity and job satisfaction; they are better regarded as possible ingredients in redesigned socio-technical systems of work.
- Socio-technical systems which have the following features seem promising in their ability to improve both productivity and job satisfaction:
- a. Financial compensation of workers must be linked to their performance.
- b. Workers and work must be matched so as to create a work situation which workers will see as capable of meeting their needs and expectations, and where they will have the capabilities and resources to be successful.
- c. For workers who desire it, their work should provide opportunity for full use of their abilities, making a meaningful contribution, having challenging and diversified duties, and being responsible for others.
- d. Workers at all levels must have inputs to plans and decisions affecting their jobs and working lives.
- Appropriate resources, including work methods and equipment, must be provided to facilitate workers' performance and minimize obstacles to carrying out their jobs.
- f. Adequate "hygiene" conditions must exist, including competent supervision, fair pay, job security, good working conditions, and sound employee and labor relations.
- A survey of \$6) [16.6% survey return) chief executive and industrial relations members of the AMA and 69 union officials (19.6% survey return) found following results:
- Managers and union officials alike regard improvements in both productivity and the quality of working life as desirable social goals.
- Barriers to adoption of needed comprehensive programs along the above lines stem both from knowledge and political considerations.
- What seems necessary is a coordinated drive by many agencies of society, including government, individual organisations, and research and consulting institutes.

Article also reviews job enrichment projects, organizational control, management by objectives, Scanlon plans and pay plans, and system wide studies at Harwood Manufacturing and Corning Glass.

Kaufman, H. G. Job design and adjustment to computer automation. Journal of Industrial Psychology, 1965, 1, 61-67.

Tests the hypothesis that the more time a worker spends at monitoring and control tasks in an automation process (i.e., the more he acts as a component of the man-machine system), the less will be his job satisfaction. Computer consols operators (N=45) were used according to the percentage of time spent at monitoring and control tasks. A correlation of -.44 was obtained between job satisfaction and time spent on the system. Among the specific dimensions of job satisfaction measured, the only items revealing significant correlations were a feeling of achievement attained from work and variety of work. Results also indicated that boredom may be an important contributor to job dissatisfaction.

Kommor, T., & Wild, R. Joh denign research. Journal Management Studies, 1973, 10, 62-81.

Report of a series of studies investigating the effects of changes in job design and job content on worker productivity. Early studies of male manual workers found that work variety (number of task changes), cycle time, batch size and setting time were related to productivity, for some workers but not all. Later studies involved job enrichment for woman manual workers eneaged in the assembly of an electro-mechanical component (Phillips LTD U.K.). The nature of the work was changed from an assembly line layout to one in which each worker was responsible for entire assembly and inspection. No general improvement was obtained with respect to output of quality. Examination of these results lead to the following conclusions:

- The nature of the work done, i.e. work content and work method, is only one aspect of job design. Job design may also be considered to include such things as wage systems, supervisory arrangements, social relations, etc. Consequently job enlargement and work rationalization are not mutually exclusive.
- Because of workers' differing needs, attitudes and circumstances, highly rationalized work may constitute a source of dissatisfaction for some workers, yet be quite acceptable to others.
- Whilet there is little evidence to suggest that there exists
  a general direct relationship between workers job satisfaction
  and their productivity in terms of output, quality etc., there
  was more evidence to suggest that job satisfaction was negatively related to labour turnover, or job tenure.
- Relationships between aspects of job design and aspects of productivity are likely to depend upon many factors both internal and external to the job situation, and hence:
- Concepts such as job enrichment might be used with benefit as measures to counteract problems of job disastisfaction, turnover, etc., in some but not all circumstances and for some, but not all, workers.
- The problems of job design are complex and multivariate and consequently the derivation of principles or procedures for job design is more appropriately pursued in specific circumtances.

Later studies of 2500 female unskilled female manual workers investigated the relationship of satisfaction and attitude to job tenure.

Findings indicated that these workers ranked financial need or wages in first place. 21% of present workers were dissatisfied with their job and 10% of previous workers. Dissatisfaction was less prevalentiamong older, married and longer service workers. 50% of labor turnover was voluntary in nature and caused by dissatisfaction over the nature of the work. They conclude that only a small percent of workers exposed to rationalized repetitive manual work expressed overall job dissatisfaction. However, a minority of dissatisfied workers cause labor turnover.

People working in urban areas were better disposed to tolerating paced work than those from rural areas. Workers age, marital status, and length of service moderated the relationship between job factors and job satisfaction.

Rendall, L. M. Canonical analysis of job satisfaction and behavioral, personal background and situational data. Unpublished dectoral dissertation, Cornell University, 1961.

Data from a large-scale study of 1230 companies was analyzed in terms of five composite variables including: pension coverage, pension benefits, retirement age policy, sire and unionization. Community variables were: prespecity, decreptitude, productive farming, urban growth, slum conditions, Northern males infant deaths, and urbanization. Personal background items and behavioral data on performance and absence were subjected to canonical analyses and cross-validated.

Hain results include the following: (a) no possible combination of satisfaction measures alone is significantly related to any possible combination of the behavioral measures; (b) satisfactorinesps, i.e., high performance and low absences; is related to certain personal background variates; (c) high performance along with high absences is associated with a combination of satisfaction and personal background data; (d) absences are related to situational data; (e) a global attitude toward the job is related to satisfaction with the nature of the work itself, as well as to community features which suggest that a present job is viewed favorably when the likely alternative available in the community is unemployment; (f) global satisfaction with the job and with life in general is positively associated with evidence of financial security; (g) satisfaction with pay is higher in communities of relatively low prosperity, suggesting the role of the community as a standard for evaluating income; and (h) what was called an avocational orientation is as-ociated with attractive community characteristics and dissatisfaction with the actual work on the job.

Kennedy, J. E. & O'Neill, H. E. Job content and workers' opinione. Journal of Applied Psychology, 1958, 42, 372-375,

Contrasted attitudes of assembly operators who performed highly routine and repetitive tasks and utility workers who performed a wider variety of these routine tasks from four departments of an automobile assembly plant. Attitude scale used was "factors influencing organizational effectiveness" which consists of 14 separate dimensions. Results were reported in terms of total survey scores by department and by job classification. Authors do not report scoring system. No significant differences were reported in mean survey scores of assembly operators and utility operators in two departments. Moreover, no differences were found on subscale scores measuring attitude toward general aspects of the work situation and those concerned with supervision. In two other departments where the utility workers job had been expanded and upgraded, a significant difference was found in overail mean score on the survey. Utility workers had more favorable attitudes than assembly workers in these two departments.

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Kerr, W. A., & Keil, R. C. A theory and factory experiment on the time drag concept of boredom. <u>Journal of Applied Psychology</u>, 1963, <u>47</u>, 4-9.

Investigated effect of job variety on time drag using a sample of 47 hourly employees of a small manufacturing plant. Employees were advised that shop clocks had been deliberately set either slover or faster than accurate times (clocks were in fact accurate). Employees estimated how fast or slow the clocks were and rated their work on an interesting-boring dimension.

Results indicated that time drag (overestimation of time) was greater in variety type than in monotony type jobs, and in long cycle jobs than in short cycle jobs. Employees own statement of job interest or job boredom was not related to time drag. Time drag was greater when the present job was less repetitive than a workers previous job.

Resselman, G. A., Mood, M. T., & Hagen, E. L. Relationships between performance and satisfaction under contingent and noncontingent reward systems. <u>Journal of Applied</u> <u>Psychology</u>, 1974, <u>59</u>, 374-376.

Relationships between performance and satisfaction with specific job facets were examined for two samples of female telephone company workers (17 draftswomen and 39 toll operators). In the contingent system, pay was based on piece rates and promotions were tied to performance; in the noncontingent system, these rewards were based on seniority. Performance levels were similar under the two systems. However, in the performance-contingent sample, performance was related to satisfaction with the work itself, pay, and promotions. In the seniority sample, performance was related to satisfaction with interpersonal factors, pay, and work.

Kilbridge, M.D. Do workers prefer larger jobs? <u>Personnel</u>, 1960, <u>37</u>, 45-48. (a)

Reports interview study of 202 (61 males, 141 females) assemblyline workers in radio-television set factory. The first interview question asked was if pace were same, if you din't have to work any harder and bonus was the same, would you prefer a line that turned out 400 or 200 sets a day? Why? The purpose of this question was to determine whether operators preferred smaller jobs (400 sets a day operator performs seven elements of work and work cycle lasts one minute) or larger jobs (200 sets = 14 work elements and 2 minute work cycle). Results indicated 51% of sample preferred small task, 37% indifferent and 12% preferred larger task. Second interview question asked workers if they preferred push line or bolt line. 84% of operators preferred belt line 6% indifferent and 10% push line. Most operators preferred belt line because it was easier and provided better rhythm. No sex differences were found in responses to either interview question. Concludes with question, if job enlargement is the clue to greator job satisfaction or do we need not larger jobs but fewer misplaced workers!

Kilbridge, M.D. Reduced costs through job enlargement. <u>Journal of Business</u>, 1960, <u>13</u>, 357-362. (b)

Reports a specific example of job enlargement in a midweut manufacturer of home washers and dryers. The centrifugal water pump is composed of 27 parts. In 1958 the assembly of the pump was being done by 6 operators on a conveyor line. A year later it was changed to a four man operation and later to a one man operation. The following table relates compartive costs and other data of the three methods of pump assembly based on production of 1500 pumps per day.

	Six man	Pour man	One man operation
Standard Work time per piece	1.77 min	1.76 min	1.49 min
Annual Labor Cost	\$19,912	\$19,800	\$16,762
Learning time	7 days	8 days	12 days
Total Annual Cost	\$20,678	\$20,448	\$18,282

Kilbridge has also pointed out that many of the positive results obtained in studies of job enlargement could be attributed to reductions in balance-delay time and nonproduction time and perhaps not to changes in worker motivations or satisfaction. King, A.S. Expectation effects in organizational change. Administrative Science Quarterly, 1974, 221-230.

Reports on an experiment conducted at four plants owned by the same company during a 12-month period (clothing manufacturer). Managers were given artificial reports about previous findings obtained in implementing job enlargement and job rotation programs. Led to expect higher productivity as a result of these organizational innovations, the managers increased their plant output during the experiment period.

Analysis of the results of an experiment in which expectations are controlled separates the effects of organizational innovation from those due to managers' expectations and shows managers' expectations to be more important sources of variation than the innovation itself. The implication is that without some means for the systematic assessment of expectancy effects, it is impossible to determine whether results in organizational innovations are due to the innovations themselves or to the correlated expectations of managers who implement the organizational change.

Ripnis, D., & Wayner, C. Effects of motivation to strive on personality-performance relationships, <u>Journal of</u> <u>Experimental Research in Personality</u>, 1965, <u>1</u>, 138-143. (a)

Tested prediction that individuals who satisted rapidly on an independent measure of persistence would show deterioration of task performance under experimental condition of high motivation. So were 214 Navy enlisted men, Ralf of the subjects completed an anagrams task under conditions that aroused motivation, other half completed task under no incentive to strive. Persistance test involved a task that causes rapid hand and arm fatigue. Previous research on the persistance test indicates that persons who are tense and aroused by stress are more vulnerable to pain and fatigue and satiste more rapidly on this type of test. Ss also completed Navy General Classification Test as measure of general intelligence. Anagrams task consisted of 120 easy 5 letter anagrams and 120 difficult 5 letter anagrams. Test was timed and performance consisted of total number of anagrams solved. A significant relationship (p.<.001) was obtained between persistence test and the number of anagrams solved under the high motivation condition but not under the low-motivation condition [p.<.10). Under all conditions more intelligent Ss solved more anagrams. A highly significant interaction was found between motivation and task difficulty (p.<.001). The performance of subjects in the high motivation condition improved from easy to hard anagrams, whereas the performance of Se in the low motivation condition deteriorated.

Kipnis, D., & Wagner, C. The interaction of personality and intelligence in task performance. <u>Educational and Psychological Mossurement</u>, 1965, <u>25</u>, 731-744. (b)

Replicated prior field studies that found that intelligence moderated the validity of two non-cognitive tests that had been developed to predict the job performance of Navy enlisted men. The first test was an attempt to measure persistence, (Hand Skills Tost) and the second test was a purported measure of passive-aggressive character structure called the Insolence Scale. The present study tested the hypothesis that task difficulty was the basis for the field study results. From 70 to 140 Navy enlisted men completed three tasks, (Anagrams and Pursuit Rotor), each of which was varied in task difficulty. Results did not support the hypothesis concerning task difficulty. Results did not support the hypothesis concerning task difficulty. However, they did yield significant interactions between intelligence, (general classification test), the two tusts, and aspects of task performance. The findings then parallel in a lab setting those of the original field studies. Internal analysis suggested that task motivation, rather than task difficulty, may be the basis for the interactions between the persistence test and performance.

Persistence did not interact with task difficulty or IQ. Concluded that performance of Ss with low persistence test scores deteriorated only under conditions or heightened motivation.

Rirach, B.A., 6 Sengermann, J.J. An empirical test of Robert Blauner's 1 ideas on allenation in work as applied to different type jobs in a white-collar setting. <u>Socialory and Social</u> Remearch 1972, 56 180-194.

Surveyed 150 employees in a bank (computer personnel, clerical workers and machine operators) using a 57 item questionmaire measuring powerlessness, meaningless, lack of promotion opportunity and self setrangement.

Results indicate that there are substantial differences in the extent to which machine operators, clerical personnel and computer programmers are subject to the alienating conditions and that that there are substantial and corresponding differences in the degree of self-estrangement experienced by these workers. Level of self-estrangement is strongly and positively related to: a) lack of control over the immediate work processes (powerless-ness); b) performance of narrow work roles due to an advanced task specialization (meaninglessness); and c) lack of opportunities for promotion.

Only 4% of computer personnel experienced a high level of self-cetrangement, 40% of clerical workers and 64% of machine operators. It was found that younger and better educated white culiar employees renot against absence of opportunity for positive innovation and independence.

Study supported Blauner's hypothesis that when a worker lacks freedom and control (powerlessness), when his role is so specialized that he becomes a "cog" in the organization [meaning-less], and when he is isolated from a community or network of personal relations at work (isolation); the result is that the worker's activity becomes only a means rather than a fulfilling end (self-estrangement).

Blauner, R. Alienation and freedom Chicago: University of Chicago Press 1964.

Klein, S. The industrial engineer: One-time black sheep becomes glamorous. New York Times. Sunday, July 4, 1971.

Reports change in industrial engineers image from efficiency expert with stopwatch in hand to designer of optimum work systems incorporating the latest computer technology.

Describes briefly IBM plant at Endicott. New York which has incorporated computerized production that generates data for controlling production inventories, product quality, costs and maintenance acheduling.

Describes educational requirements of industrial engineers and relationship of this field to business management, economics, and other aspects of engineering.

Klein, S.K., & Ritti, R.R. Work pressure, supervisory behavior and employee attitudes: A factor analysis. Personnel Psychology, 1970, 23. 153-167.

Reports the results of a fixed-alternative questionnaire given to 1500 blue collar workers in 111 departments of an electronics equipment manufacturing facility. Employee-oriented supervision, (as opposed to product-oriented supervision, was associated with high social coheaion, low social divisiveness, low perception of work pressure, and low perceived power of first-line managers.

Perception of power in the job of industrial engineer was associated with feelings of loss of job autonomy on the part of the production workers. Low feelings of work pressure were associated with high group cohesiveness.

Kobayashi, S. Motivational management - its exploration in SONY (July 1969), Unpublished available from Shigeri Kobayashi; Managing Director, Management and Personnel Development, SONY Corporation, Japan.

Reports on innovations at SONY transistor plant in Atsugi, Japan. Plant employs 3300 employees (65% female teenage girls). Innovations include honor system in cafeterias, worker's autonomy in dormitory, recreation activities, elimination of time clocks, and establishment of cells composed of teams of 2-20 workers. Formal authority and hierarchial distinction have been reduced. Cell members and informal leaders determine work pace, quality, safety, training and work standards.

Konz, S.A. & Dickey, G.L. Manufacturing assembly instructions: A summary, Ergonomics, 1969, 12, 169-382.

Reports on a series of 13 experiments over a period of four years investigating various methods of presenting work instructions to employees. It is concluded that the communication medium is very important and that different media affect both time and errors. Error rates can be cut to from one-third to one-tenth of existing rates while the associated assembly time is usually cut to one-half of the existing time. Four different assembly tasks were used. (Pegboard, electrical wiring, food service, and soldering techniques). The number of subjects in each experiment ranged from 8 to 64. A wide variety of communication techniques such as a typed list of szep-by-step instructions, three picture slides per assembly, one picture slide per assembly, a list with a place keeping device, sudio, and 'information board', audio plus a list, slides plus audiq, photographs, and models were used.

The best medium is pictorial in which an operator can match a picture with the assembly to be built.

Less desirable media are those (such as a typed step-by-step list of instructions) which require the operator to translate abstract symbols such as words into a mental image and then match his assembly with the mental image.

If abstractions such as colours, directions, and relationships are presented by audio, the problem of both memory or
referability and translation occurs. Once the message has been
presented it is gone. Therefore, the operator must, in effect,
memorize the instruction when it is presented. Even if the
operator is permitted to control the rate of presentation of the
information, momentary lapses or interruptions may cause information
to be omitted or misinterpreted. Tape recorded instructions tend
to have a strong pacing effect which restricts productivity.
Verbal orders should be avoided. The slide-booklet approach has
the highest benefit/cost ratio.

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Korman, A.K. Expectancies as determinants of performance. Ex-perimontal Publication System, 1970, Issue No. 5, Ms. Mo. 1744. (a)

Reports on five laboratory and field studies which investi-gated the effects of situational variables on the hypothesis that performance is a function of the expectancies which others have of competency and ability

In Study 1, 5s were freshman psychology students divided into two groups (high expectancy and low expectancy). Subjects had to indicate the appropriate level of performance on four creative tanks. Each group was told that the same experiment had previously been completed by college students and the experimenter listed the high performance for each task for the high expectancy group and the low performance for the low expectancy group. Study 2 was identical to Study 1 except students completed Monderlic Personnel Test as measure of intelligence. Results provide support for the hypothesis. In the higher intelligence groups, the effects of the experimental manipulation is somewhat decreased.

Studies 3, 4 & 5 were field studies to determine if the higher the level of competence expected of employees, the higher the resulting work motivation and work performance. Study 3 used low level Civil Service office employees. Study 4: consisted of high level technical employees (college graduates) in a university computer center. Study 5: clerical employees in bank. All subjects completed a questionnaire designed to measure the extent to which employees felt that high performance was expected of them and their general level of work motivation. general level of work motivation.

Criterion measure was supervisors performance evaluations. The criterion variable was divided into excellent and average ratings and mean differences for each of these groups on each item of the expectancy questionnaire were computed. The results were as predicted in all cases. The excellent employees scored higher on most of the questions relative to expectations. General findings of these studies are that expectations from others are related to performance regardless of source of expectancy or the characteristics of the worker.

Korman, A.K. Toward an hypothesis of work behavior. <u>Journal of Applied Psychology</u>, 1970, 54, 31-41. (b)

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Presents a theoretical hypothesis which summaries a considerable portion of what is now known about the nature of work performance and work attitudes within a relatively consistent framework. Sypothesis is related to other theories of work behavior. Empirical tests of specific predictions from the hypothesis are provided and areas of further research are indicated.

The hypothesis and derivations are detailed below.

Hypothesis: All other things being equal, individuals will engage in and find satisfying those behavioral roles which will maximize their sense of cognitive balance or consistency.

Derivations: 1. Individuals will be motivated to perform on a task or job in a manner which is consistent with the self-image with which they approach the task or job situation.

2. Individuals will tend to choose and find most satisfying those job and task roles which are consistent with their

Pollowing conclusions from empirical tests of hypothesis seem warranted.

- Self-perceived competence for a task seems to facilitate performance on the task, particularly if the task provides one knowledge of how close/far he is to goal achievement.
- Social evaluations of one's competence for a task, even 2. Social evaluations of one's competence for a test, even when it is not based on previous task experience but rather on subjective dimensions of a nonexperimentally based nature, appear to become internalized by the individual in such a manner as to affect his performance for the task.
- The utilization of increased task goals as a way of increasing performance seems to be an effective way of increasing performance, provided the person is interested in achieving task

Kornhauser, A. Mental health of the industrial worker. New York: Wiley, 1965.

Reports a study of attitudes of automobile plant workers in Detroit and the immediate vicinity. Sample consisted of 655 men who were interviewed at length using structured and open-end questions. The analyses of the interdependence and relationship of job satisfaction to good mental health was the major objective of the study. The criteria or indices of mental health consist of (1) manifest anxiety and emotional tension (2) self-esteem (3) hostility vs. trust (4) sociability and friendship (5) overall satisfaction with life (6) personal morals vs. anomic. These indices were chosen as having face validity, but may be biased in that they are based perhaps on middle class values. In addition, only a small sample of low ranking white collar workers were provided as a base line for comparison on the mental health index.

Generally the results indicated that many production workers gave interview responses indicative of poor mental health. Indications of poor mental health increased as job level decreased (from skilled workers to semiskilled workers with repetitive tasks). He concluded that job simplification is a cause of poor mental health.

The study had a number of methodology problems and may re-resent an overgeneralization from urban blue collar workers to all blue collar workers. In addition, differences in workers' personal backgrounds were ignored.

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Kornhauser, A. W., & Sharp, A. A. Employee attitudes: Suggestions from a study in a factory. <u>Personnel Journal</u>, 1932, 10, 393-404.

To secure a picture of the major influences affecting individual feelings and attitutes of a group of women factory workers (200-300 females in 1930) an investigation was undertaken. Mork feelings and attitudes were tapped by questionmaire and interview methods. Great care was taken to get the cooperation and trust of workers and supervisors. Purely statistical evaluation of the data is subordinated to more personal, not objectively provable "understandings" or interpretations based on insight into the whole picture. Some findings, however, were objectively verified. In two departments all work conditions were fundamentally the same, with one exception—character of supervision. Great dissatisfaction in one department could only be explained by the unfortunate nature of the supervision there. It is significant that negative feelings aroused by poor supervision spread to other and unrelated matters. Some slight relationship was found between attitudes and measured facts about the workers. (e.g. Productivity, however, sick time attitude was not related to efficiency ratings.) Correlations between favorableness of attitudes and individual scores for sometional adjustment are low but positive. The data are analyzed to find the scores to positive to some productive of the supervision of lay-off or loss of job entirely is most pervasive. off or loss of job entirely is most pervasive.

Kraft, W.P., & Williams, K.L. Job redesign improves productivity. Personnel Journal, 1975, 54, 393-397.

Discussed job enrichment at Bankers Trust Co., New York in area of handling deposits to customers checking accounts. Supervisors were given the tank of redesigning jobs. In the regular and special accounts department they also developed a clerical appraisal system along the lines of the MNO model. In business accounts the supervisory team was aided in developing a mastery test given to all new clerks after two months to be used in coaching and training. Jobs in accounting control were also enriched. Results indicated that in regular and special accounts, forgeries paid fell 56% from the year 6/71 to 6/72 to the 6/72 to 6/73. Misfiled items decreased 19.2% in the same period. Complaints from branches fell 20-30% a month beginning in 1/73. Staff level in file and referral areas was reduced 16% despite 1% more check volume and 0% more referrals. Productivity index of the first half of 1973 was 110.1 compared to target level of 98.5. In business accounts, error rates fell from 2.46% in the first month of "a three month period" to 1.40% in the third month. Total cycle error rates fell from .65% to .53% in a comparable period. Staff level dropped 22% by end of 1973. Productivity index before job enrichment was 88.3%. It rose to 108.6% by the end of 1973. In accounting control, clerical capacity rose 34.7% from 6/73 to 9/73. Discussed job enrichment at Bankers Trust Co., New York in

Krieger, W.G. The visual environment and task performance. Technical Report No. 45, May, 1972, Purdue University, Contract Monr N00014-A-0226-0007, MR 177-911, Office of Naval Research.

Investigated effects of an attractive and unattractive work environment on teak performance and attitude. So were 72 male and female freshman students who completed a series of tests in one of two rooms differing in seathetic appeal, organization and phenomonological size. Lighting, temperature-ventilation and physical size were held constant. Subjects completed Minnesota Clerical Test, Matcon-Claser Critical Thinking Appraisal, Alternate uses test, mood checklist and environment description scale. Results indicated that despite successful manipulation of the independent variable (environment as measured by description scale), this variable had no effect on task performance or mood of the subjects.

Kuhlen, R.G. Needs, perceived need satisfaction opportunities and satisfaction with occupation. <u>Journal of Applied Psychology</u>, 1961, 42, 56-64.

Tested hypothesis that if major motives are satisfied in the context of work and career, then satisfaction with occupation should be a function of the discrepancy between personal needs and perceived potential of occupation for satisfying needs, particularly among those for whom occupation constitutes a major course of satisfaction (e.g., men rather than women), and in the instance of occupationally relevant needs, such as need achievement. The Edwards Personal Preference Schedule, a special rating scale, and a questionnaire were administered to 100 men and 95 wwmen teachers. As predicted, discrepancy scores correlated .25 (pt.01) with occupational satisfaction for men, and .02 (ns) for women. Achievement need discrepancies were consistently related to occupational satisfaction. Other findings confirmed that occupation is psychologically more central for men and that occupational satisfaction is a function of the degree to which needs are satisfied in the occupation.

Kuhn, G., Slocum, J.W., & Chase, R.B. Does job performance affect employee satisfaction? Personnel Journal, 1971, 50, 455-459, 485.

The satisfaction of security and social needs is more closely associated with job performance than the satisfaction of job autonomy and self-actualisation. Data were obtained using the Porter need satisfaction questionnaire distributed to 184 monsupervisory personnel in a Pennsylvania steel mine. Results suggest that the relationship between "extrinsic" rewards and job performance is strengthened by incentive pay.

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Kuriloff, A.H. An experiment in management: Putting Theory Y to the test. <u>Personnel</u>, 1963, 40, 8-17.

Describes application of McGregor's Theory Y to experiments in management at Mon-Linear Systems Company. These include horizontal form of organization and responsibility, emphasis on teaching and training and not on directing and controlling, team self-paced production, completion of a whole production or management job. Company has multiplied its product line fourfold and has shown improving productive effectiveness.

Kvalseth, O.T. & Crossman, E.R.F.W. The Jaquesian level-of-work estimators: A systematic formulation. <u>Organizational Behavior and Muman Performance</u>, 1974, 11, 303-315.

The time-span of discretion concepts advanced by Elliot Jaques as a basis for his proposed method of estimating the so-called level of work for all types of organizational roles are formulated systematically within the context of a general organizational control system. The Jaquesian level-of-work estimators are then expressed in terms of practise mathematical formulations and exemplified through an empirical case study. The final results of such estimation for 29 roles or positions in one firm are presented. These data provide some further empirical validation of Jaques' method by showing that such estimates are highly correlated with the firm's rankings for the roles (re-91) and with the actual wage and salary structure used by the firm. (re-96).

Landy, F.J. Motivational type and the satisfaction-performance relationship. <u>Journal of Applied Psychology</u>, 1971, 55, 406-412.

Discusses the importance of individual differences in the areas of job satisfaction and work motivation. The logic of subgrouping was combined with a consideration of individual differences in the motivation to work in an attempt to shed some light on the satisfaction-performance relationship. 175 professional engineers were subgrouped on 3 motivational dimensions. Motivational type was tested as a moderator of the relationship between 5 factor analytically derived satisfaction dimensions and 6 performance dimensions. Two of the emerging types showed moderator characteristics.

Lanzetta, J.T. & Roby T.B. Group performance as a function of work distribution patigine and task load. Acts Envirologics, 1956, 12, 95-104.

Study which impestigated the relationship between two methods of work distribution and group performance, under two task load conditions.

Two types of structure were used: one based on a functional classification of activities (vertical structure) and the second involing a sub-task discrimination (horizontal structure).

Vertical structure. Three essential activities were distinguished; observation, calculation, and decision making. One group member was assigned the task of monitoring the "position report" input and making the necessary plane moves on the intercept board (observer). The second group member was given responsibility for identification of aircraft to determine if they were friendly or enemy. He also was required to keep track of the fuel status of interceptor aircraft (calculator). The third group member was responsible for all decisions concerning deployment of the friendly interceptor force (decision maker). The functional discriminations utilized were based on an analysis of the stages in the problem-solving processes of groups suggested by Roby and Forgays.

Horizontal structure. As previously mentioned, there were three target areas to be defended and three associated interceptor bases. For the horizontal-structure condition each group member was assigned the responsibility of defending one of the targets with the three available interceptor planes. Thus, each member had to move all planes in his erea in response to position reports; each had to identify, as energy or friendly, planes in his area; and each had to identify, as energy or friendly, planes in his area; and each had to make decisions about the moves of his interceptor defensive force. In essence, the problem was broken down into three sub-tasks requiring all the activity demanded by the over-all task.

Two task-load conditions were used. Under high-load conditions fifteen planes were employed; nine were enemy bombers, six were friendly planes for which flight plans were submitted. Under low-load conditions ten planes were employed; six were enemy bombers, four were friendly planes with flight plane. Two attack patterns for each task load were constructed.

Major results were high-load conditions resulted in generally poorer performance as would be expected. However, under high-load conditions performance improved with practice, while under low load the converse was true.

The vertical structure (differentiation by functions) results in poorer performance although the difference is not significant. The interaction between load and structure, of primary interest in this study, is also not significant. However, a reversal in the relative superiority of the horizontal over the vertical structure occurred under high-load conditions. Thus, although the difference between these is not significant, the horizontal structure was superior under low-load conditions while the vertical structure was superior under high-load conditions.

The tentative hypothesis may be advanced that, as the difficulty of an element of a task increases, there will be a tendency to fixate on this activity to the exclusion of other less difficult, though equally important, task activities. When such is likely to be the case, it may be advantageous to fix responsibility for these other important activities to insure the groups' attending to those functions.

14.

Lawler, E.E., III. Equity theory as a predictor of productivity and work quality. Psychological Bulletin, 1968, 70, 596-610. (b)

Compared and contrasted the predictions of equity theory with respect to the effects of inequitable payment. The literature relevant to testing equity theory's predictions about 4 inequitable payment situations was considered. Specifically, the piece-rate overpayment, hourly overpayment, piece-rate underpayment, and hourly underpayment situations were viewed. In addition, the methodological problems with the research designed to test equity theory were considered. It was concluded that the data from the 2 hourly situations do not make a convincing case for the view that equity theory is needed in order to explain how people react to hourly over and underpayment. However, equity theory did appear to be useful in explaining the results of the studies concerned with piece-rate over and underpayment. It was suggested that by including some concept of equity into the more general expectancy-theory approach the results for the piece-rate situation could best be explained. Specifically, it was suggested that he explained. Specifically, it was suggested that the explained. Specifically, it was suggested that preceived equity sight be treated as I factor that influences the valence or attractiveness of rewards.

Lawler, R.E., III. Job design and employee motivation. <u>Personnel Psychology</u>, 1969, 22, 426-435.

Review of job enrichment concepts. When a job is structured in a way that makes intrinsic rewards appear to result from good performance, then the job itself can be a very effective motivator. In addition, the point was made that, if job content is to be a source of motivation, the job must allow for meaningful feedback, test the individual's valued abilities, and allow a great amount of self-control by the job holder. In order for this to happen, jobs must be enlarged on both the vertical and horizontal dirensions Purther, it was predicted that job enlargement is more likely to lead to increased product quality than to increased productivity. A review of the literature on job enlargement generally tended to confirm these predictions and is presented in the following table:

Research Study	Higher Quality	Higher Productivity
Biggane and Stewart (1963)	Yes	No
Conant and Kilbridge (1965)	Yes	No
Kilbridge (1960)		
Davis and Valfer (1965)	Yes	No
Davis and Worling (1960)	Yes	Yes
Elliot (1953)	Yes	Yes
Guest (1957)	Yes	No
Murlioff (1966)	Yes	Yes
Marks (1954)	Yes	No
Rice (1953)	Yes	Yes
Walker (1950)	Yes	No

Lawler, E.E., ITQ. Job attitudes and employee motivation: Theory, research, and practice. <u>Personnel Psychology</u>, 1970, 21, 223-238.

Research on job attitudes and motivation has shown that the relation between satisfaction and performance is a complex one. Satisfaction is an indicator of an employee's motivation to come to work but influences job performance very indirectly. Performance can under certain conditions directly influence satisfaction. Models for extrinsic motivation and for intrinsic motivation and important attitudes are described. Implications for practice are presented.

Lawler, E.E., III. Motivation in work organizations. Monterey, California: Brooks/Cole Publishing, 1973.

Notivational determinants of behavior in organization. Review of motivation theory, job satisfaction theories, job design and performance, interpersonal influences. Expectancy theory is developed in terms of review of factors that affect porformance outcome and effort-performance expectancies.

Lawler, E.E., III & Hackman, J.R. Impact of employee participation in the development of pay incentive plans: A field experiment. Journal of Apolied Psychology, 1969, 51, 467-471.

Peports on a study of effects of employee participation in the development of pay incentive plans. The Ss were part-time workers who clean buildings in the evenigns. Three automonous work groups developed their own pay incentive plans to reward good attendance on the job (Condition A). These plans were then inposed by the company on other work groups (Condition B). There were two groups of control Ss: One talked with Es and job attendance problems but received no additional experimental treatment, and the other received no treatment. A significant increase in attendence followed only Condition A. Possible reasons cited: (a) participation caused Ss to be more committed to the plan; (b) Ss who participated in the development of their plan were more knowledgeable about it; and (c) participation increased the employees' trust of the good intentions of management with respect to the plan.

Lawler, E.E., III, Hackman, J.R., & Kaufman, S. Effects of job redesign: A field experiment. <u>Journal of Applied Social Psychology</u>, 1973. 2, 49-62.

Studied a telephone company project of redesigning the job of directory assistance operator to determine the effects on workers of "job enrichment" programs. The change increased the amount of variety and the decision making autonomy in the operator's job. However, no change in work motivation, job involvement, or growth need satisfaction occurred as a result of the changes. Instead, the changes had a significant negative impact on interpersonal relationships. After the changes, older employees reported less satisfaction with the quality of their interpersonal relationships, and those supervisors whose jobs were affected by the changes reported less job security and reduced interpersonal satisfaction. Implications of these findings for the 1971 theory of job redesign proposed by J.R. Hackman and E.E. Lawler are discussed.

Lawler, E.E., III. 4 Hall, D.T. Relationship of job characteristics to job involvement, satisfaction, and intrinsic motivation. <u>Journal</u> of Applied Psychology, 1970, 54, 305-312.

Reports results of questionnaires completed by 291 scientists, all of whom worked in research and development laboratories. The results of a factor analysis indicated that job-involvement attitudes, higher order need-satisfaction attitudes, and intrinsic-motivation attitudes should be thought of as separate and distinct kinds of attitudes toward a job. These three types of attitudes were found to be related differentially to job design factors and to job behavior. Satisfaction proved to be related to such job characteristics as the amount of control the job allowed the holder and the degree to which it is seen to be related to either self-rated effort or performance. Job involvement, like satisfaction, bore a significant relationship to certain job reharacteristics; unlike satisfaction, however, involvement was less strongly related to self-rated effort. Intrinsic motivation was less strongly related to both effort and performance than was either satisfaction or involvement, but was

The following table summarizes the relationships of the 3 variables to job characteristics.

TABLE 1

15

Massas Constitution nervices for Samearton, Involvement, and Mettyation Items

-	Actions y and self- actual extens satisfaction (Stress 2, 2, 2, 4)	Involvement (Items 7, 8, 9, 10)	Motivation (Items 13, 14, 15, 16)
Jub altures me to be creature Mark Bride control and soar say Groundhurses on skut grow on a department Chance to the present of 30 tone Jub province in statem Lab province sortedly obtaining pile Jub grow to the Statement on Statement BV mad effort Self-sout effort Self-sout performance	******	halifaala	41

The state of the s

Lawler, E.E., III & Porter, L.W. Antecedent attitudes of effective managerial job performance. <u>Organizational Behavior and Human Per-</u> formance, 1967, 2, 122-142. (a)

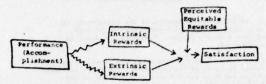
Examined the effects of valence, instrumentality, role perceptions, and their interactions on the performance of 154 managers. Subjects were asked to indicate how instrumental three factors (effort, high productivity, and good job performance) were for the attainment of seven second-level outcomes and the valence of these outcomes. Responses to the instrumentality items were summed to form a composite instrumentality index. Role perceptions were obtained from 55 of the managers by having them rank 10 inner and outer-directed traits first on the basis of self-description and second on the basis of importance for success. Six criteria (three ratings of effort and three of performance) were obtained.

The median correlation between instrumentality and (a) performance was .11 and (b) effort was .18. Correlations between valence and the criteria were not reported. Out of 42 possible correlations between valence times instrumentality acores and the criteria, 29 were larger than the correlations between instrumentality and the criteria alone, 5 were the same, and 8 were smaller. Finally, high and low valence times instrumentality groups were formed, and correlations between role perceptions and performance were computed. Some of the correlations within groups were significant, but the correlations between groups were not significantly different. The results thus offer some support for the interaction of valence instrumentality and role perceptions.

Lawler, E. E. 11, & Porter, L. W. The effect of performance on job satisfection. Industrial relations & Journal of Rooncmy and Society, 1967, 1, 20-28. (b)

Reviews briefly the research literature on job-satisfaction and performance relationship. Evidence indicates a low but consistent relationship between satisfaction and performance, and a strong correlation between satisfaction and absenteeism and turnover. Presents a theoretical model to explain imperfect relationship in the model-satisfaction is caused by performance. Good performance leads to rewards moderated by expected equitable rewards which leads to satisfaction. See diagrams.

## The Theoretical Model



In a research study derived from this model, data was collected from 148 (31 females, 117 males) middle and lower level managers in four social services agencies and one industrial company. Superiors and peers ranked the manager on how hard he worked and how well he performed his job. The manager filled out a questionnaire on his degree of satisfaction in 5 areas: (security, social esteem, autonomy and self actualization). Mosuits indicated that the manager's overall job satisfaction was zore strongly related to superior's and peers rankings of performance (r=32 & r=30) than to rankings of effort (r=.2) & r=.20).

Satisfaction of high order needs e.g. self-actualization was more strongly related to performance (r=.30) than lower level needs like security (r=.21).

Concludes that rather than try to maximize satisfaction generally it becomes appropriate to be more concerned about. which people and what kind of needs are satisfied in the organization.

Lawler, E. E., III & Suttle, J. L. A causal correlational test of the need hierarchy concept. Organizational Behavior and Human Performance, 1972, 7, 265-287.

Collected longitudinal data from 187 managers in two organizations in order to test the validity of the need hierarchy concept. All subjects completed the Porter questionnaire which is designed to measure need satisfaction and need importance. One group of subjects completed the questionnaire at the beginning of the study and six months later, the other group completed it at the beginning of the study and 12 months later. Because longitudinal data were collected it was possible to compute static correlational analysis. The data from these analyses offered little support for the view set forth by Maslow and others that human needs are arranged in a multilevel hierarchy. The implications of this for future research are considered and it is suggested that needs may be arranged in a two-level hierarchy with the basic biological needs on the bottom level and all other needs on the top level.

Lawrence, P.R. & Lorsch, J.W. Differentiation and integration in complex organizations. Administrative Science Quarterly, 1967, 12, 1-47. (a)

Comparative study of six organizations operating in the name industrial environment. The subsystems (sales, research, and production) in each organization were differentiated from each other in terms of subsystem formal structures, the member's goal orientation, sealer's time orientation, and member's interpresonal orientations. This differentiation was related to the requirements of the particular subsystem dealt. A relationship was found between the extent to which the states of differentiation and integration in each organization set the requirements of the environment and the relative economic performance of the organizations. Within each organization the degree of differentiation of behavior and orientation between the various subsystems was found to be inversely related to the degree of integration between these subsystems. Since this environment required that economically high performing organizations be both highly differentiated and well integrated, an investigation was also made into how effective organizations stained both of these antagonistic states.

All six organizations had similar integrative devices (integrating teams and departments), but in the high performing organizations the integrative devices more fully mot six determinants of effectiveness, which included factors of intermediate position of integrative subsystem, influence of integrators derived from technical compotence, rewards perceived as related to total performance, high influence throughout the organization, influence centered at requisite level, and problem solving approach to conflict resolution.

Lawrence, P. R., 6 Lorsch, J. W. <u>Organization and environment</u>: <u>Managing differentiation and integration</u>. Boston: Narvard University Graduate School of Business Administration, 1967, (b)

Basic theme is considering kind of organization necessary to deal with various economic and market conditions. A number of concepts are proposed. First differentiation is the division of the organization into parts that perform different functions such as sales, research or production. With differentiation comes the problem of integration. Integration is defined as the quality of collaboration which exists among departments that are required to achieve unity of effort due to environmental demands. Integration may be achieved by hierarchial control, committees, special integrative departments and interaction outside official channels. The more differentiated an organization the more difficult it is cachieve integration and the more conflict laden. Environmental demands which include technical and economic conditions affect the structure and operations of the organization.

Support for this conceptual model is provided from questionmairs and interview data from ten organizations.

Leamon, T. B. An investigation into the effects of knowledge of results on operator performance. <u>Ergonomics</u>, 1974, 17, 639-650.

The effect of Knowledge of Results on the performance of female operators engaged on repetitive hand work in industry was investigated over a 40-day period. Significant changes in performance were observed.

The relationship of these findings to earlier conflicting studies is duscussed in terms of two mechanisms, the first utilizing information to elter and maintain the work pace and the second utilizing the feedback to motivate the subjects to alter their paces. Concludes Knowledge of Results helps in terms of information and not motivation.

Leavitt, H. J. Some effects of certain communication patterns on group performance. <u>Journal of Abnormal and Secial Psychology</u>, 1951, 46, 38-50.

Experimental study of four communication patterns - circle, chain, x and wheel (N=100 undergraduates divided into 20 groups of 5 men each.

Within the limits set by the experimental conditions - group size, type of problem, source of Ss - these conclusions seem warranted:

- The communication patterns within which our groups worked
  affected their behavior. The major behavioral differences attributable
  to communication patterns were differences in accuracy, total
  activity, satisfaction of group members, emergence of a leader, and
  organization of the group. There may also be differences among
  patterns in speed of problem solving, self-correcting tendencies,
  and durability of the group as a group.
- 2. The positions which individuals occupied in a communication pattern affected their behavior while occupying those positions. One's position in the group affected the chances of becoming a leader of the group, one's satisfaction with one's job and with the group, the quantity of one's activity, and the extent to which one contributed to the group's functional organization.
- 3. The characteristic of communication patterns that was most clearly correlated with behavioral differences was centrality. Total pattern differences in behavior seemed to be correlated with a measure of centrality we have labelled the peripherality index. Positional differences in behavior seemed to be correlated with the positional peripherality indices of the various positions within patterns.
- 4. It is tentatively suggested that centrality affects behavior via the limits that centrality imposes upon independent action. Independence of action, relative to other members of the group is, in turn, held to be the primary determinant of the definition of who shall take the leadership role, total activity, satisfaction with one's lot, and other specific behaviors.

More precisely, it is folt that where centrality and, hence, independence are evenly distributed, there will be no leader, many errors, high activity, slow organization, and high satisfaction. Whatever frustration occurs will occur as a result of the inadequacy of the group, not the inadequacy of the environment.

Where one position is low in centrality relative to other members of the group. that position will be a follower position, dependent on the leader, accepting his dictates, falling into a role that sllows little opportunity for prestige, activity, or allowatesion.

Lee, M.C. Do workers really want flexibility on the job? Presentel, 1965, 4, 74-77.

Report of effects of EDP computer installation in shoe manufacturing plant. Personnel interviews were conducted with 40 employees to ascertain effect of computer on work environment and work satisfaction. Norkers compared job aspects before and after computer installations. Results indicated that both managerial and clerical workers felt that computer imposed increased deadlines on their jobs, increased amount of cooperation required with other departments, reduced their freedom and flexibility of work methods and increased task variety to a small extent. Clerical workers felt that there was a marked decrease in their ability to control work pace whereas managerial employees felt only a slight decrease in this respect. All employees expressed increased satisfaction with their work. The managerial employees were more content with work conditions after the computer increased workers knowledge about job and confidence in work performance which resulted in increased satisfaction.

Lehrer, R. M. Job design. Journal of Industrial Engineering. 1958. 2, 439-446.

Discusses job enlargement principles based on premise that jobe can be designed that are both mechanically efficient and efficient from the standpoint of the dignity of the individuals performing the work. Briefly reviews job enlargement changes in assembly line job, Hawthorne studies, and Harwood manufacturing study regarding resistance to change. Enumerates principles of motion economy which are as follows.

Principle 1, the law of conservation, is basic to all work simplification efforts. Principles 2 through 4, goal recognition, dignity of work activity, and nelf-determination, pertain to the non-physical working environment and the development of a positive direction for the human factors that are so intimately associated with all work problems. Principles 5 through 8, work elimination, smooth and balanced flow, effectiveness, and simplicity and directions, deal with the improvement of work methods. Principles 9 through 12, standardization and pre-planning, quantitative evaluation, proper installation, and the dynamics of charge, relate to the unification, evaluation, application, and continued use of effective work methods.

Job design based upon broad criteria of economic and social desireability achieve both short and long range objectives of an organization.

Levine, B.L. Problems of organizational control in microcosm: Group performance and group member satisfaction as a function of differences in control structure. <u>Journal of Applied Psychology</u>, 1973, 56, 186-

Studied two aspects of organizational control structure—amount of control possessed by all organizational members and distribution of this control—in 64 1-porson groups of undergraduates using releplaying techniques. Two hypotheses were tested and found significant (p < .05): (a) the higher the total amount of control of group members over decision making and the more equally the members share this control, the better the groups problem-solving performance and the higher the members' satisfaction; and (b) these effects may be accounted for, in part, by more positive socioemotional interactions within those groups with higher amounts and more equal distributions of control.

Levine, J.M., Kramer, G. G., & Levine, E.N. Effects of alcohol on human performance: An integration of research findings based on an abilities classification. <u>Journal of Applied Psychology</u>, 1975, <u>60</u>, 285-293.

The tasks used in 41 studies of the effects of alcohol on human performance were classified in terms of the abilities required for task performance. For each category of task, median performance computed across all studies within the category was plotted as a function of both dosage and the time between alcohol administration and task performance. It was found that the curves relating performance to domage differed as a function of the ability requirements of the task. The effects on performance of time from the start of drinking to the initiation of task performance also depended upon the particular abilities required by the task. Despite many differences among the specific tasks involved, their categorization according to ability requirements enabled an integration of results and the establishment of tentative functional relationships between performance, dosage, and time from ingestion.

Levine, J.M., Romanhko, T., & Pleishman, E.A. Evaluation of an abilities classification system for integrating and generalizing human performance research findings: An application to vigilance tasks. <u>Journal of Applied Psychology</u>, 1973, 56, 149-157.

Classified the tasks used in 53 studies in the vigilance literaturo in terms of the abilities required for task performance (perceptual speed, flexibility of closure, selective attention, time sharing). For studies falling within each category of task, mean performance computed across studies was plotted as a function of time in the vigil. The curves relating time in the vigil to detection accuracy were found to differ as a function of the ability requirements of the tasks. Similarly, when the effects of selected independent variables (e.g., signal rate, sensory mode, and knowledge of results) on performance were examined, different functional relations were found depending on the abilities required by the tasks. Thus, classification of these experimental tasks by an abilities taxonowy improved generalizations about the effects of independent variables on vigilance performance; relation were revealed which had been obscured without these task classifications.

Levitan, S.A., & Johnston, W.B. Job redesign, reform, enrichment exploring the limitations. <u>Monthly Labor Review</u>, 1973, 26, 35-41.

Brief review of job enrichment projects at ATGT. Bankers Trust, Merrill Lynch, Pierce, Penner and Smith, Xerox. Donnelly Mirrors, and Texas Instruments.

Points out major gaps in the case for job reform-inadequate data and controls on job design projects, fading of novelty effect, limits of participative management, required capital investments, division of labor and efficient mass production and jobs that can not be changed.

Concludes that even in view of the obvious limitations on job enrichment and that the experimental evidence is incomplete that the job reform results indicate that substantial improvements can be made within the framework of efficient profitable enter-

Levitan, S. A., & Johnston, W. B. Work is here to stay, alas. Olympus, 1974.

Review of statistics, and worker surveys. Concludes that proportion of population holding jobs is increasing. Today's work force is younger, more affluent and better educated. Most workers seem to adjust well to their employment situation; turnover and labor unrest are less pervasive today. There is mixed evidence concerning the quality of work. Overall skill levels of workers have increased. Proportion of managers and professionals has increased fourfold. Number of unskilled workers has declined from 1-8 to 1-20.

Authors find little evidence that technology has humanized the factory or that work redesign has provided improved working conditions or higher employee satisfaction. Authors state most important factor in job satisfaction is not working conditions

Levitan, S. A. & Johnston, W. B. Job redesign, reform, enrichment -Exploring the limitations. <u>Vocational Guidance Quarterly</u>, 1975, 24, 172-180

Briefly reviews job enrichment at AT & T, Banker's Trust and Marrill Lynch, Pierce, Fenner and Smith, and Xerox. Work restructuring at Donnelly Mirrors and other companies.

Points out following gaps in job redesign success stories and problems:

- 1. Successes of companies not involved in job redesign.
- 2. Pailures not reported.
- 3. Lack of experimental controls.
- 4. Novelty wears off.
- 5. Capital investment required to alter production.
- 6. Return to craft production impractical.
- 7. Repetitive tobe are decreasing.
- View that jobs of future will require workers capable of change is not upheld. Seven large occupational groups (e.g., Secretary) are in job that haven't changed much.
- Some workers will have to be paid to do menial tanks.
   Economic system determines if a job is worth doing. And some jobs cannot be changed.

Concludes that job reform has made substantial progress. But it may not work for all workers or all jobe. Moreover, job reform should represent the wishes of the workers rather than managers and consultants.

Lichtman, C. M., & Hunt, R. G. Personality and organization theory: A review of some conceptual literature. <u>Psychological Bulletin</u>, 1971, 76, 271-294.

Reviews and comments on the ways different theories have dealt with, or contributed to, the "structuralistic" versus "personalistic" dilemma in theories of organizations. The several views are classed under four conceptual rubries: (a) traditional structural approaches (e.g., Marx and Meber), (b) modern structural approaches (e.g., Argyris and McGregor), (c) personalistic views (e.g., perceptual theories), and (d) integrating approaches (e.g., system and role models). It is concluded that the extreme variability found within and among organizations renders the one-sided normative theories less useful in understanding organizational behavior than models that recognize situational contingencies.

It is neither meaningful nor useful to promote normative, one-sided theories intended to account for all organizational situations. There is good evidence that organizational behavior is the outcome of a variety of highly conditional and highly contingent relationships and situations. Future theory will need to build on the foundations of those premises.

Life Magazine, Boredom spells trouble on the line: Factories contend with a new industrial revolution. <u>Life Magazine</u>, Septemb 1, 1972, 30-38.

Journalistip report of effects of job boredom. Reports that absenteeism now runs as high as 13% as compared to 3% a few years ago. Younger auto workers who are better educated and less compliant than parents find that pay is not sufficient recompense for life spent on the line. Contrasts attitudes of one young auto worker and his father, a steelworker. Reviews job onrichment principles (1) fix responsibility as far down as possible (2) give enough authority to go with responsibility (3) let workers know the concrete results of their suggestions and improvements (4) create a climate that encourages change.

Briefly reports on Volvo plant that is designed so one work team can assemble large sections of a car from beginning to end. Long term answer to job boredom in U.S. may be a sixture of short-er assembly lines, increased automation, small semi-autonomous work groups who set their own work methods, salary systems and pro-duction goals, and profit sharing.

Lion, J. S., Richardson, E., Weightman, D., & Browne, R. C. The influence of the visual arrangement of material, and of working singly or in pairs, upon performance at simulated industrial inspection. <u>Ergonomics</u>, 1975, 18 (2), 195-204.

Three conveyor belts were made to examine the effect of (1) the visual arrangement. (2) working singly or in pairs, on a simulated industrial inspection task. Ninety-six subjects were given three 12-minute tost sessions, one at each conveyor, inspecting plastic discs for surface flaws. The test material was designed so that it could be sorted and counted automaticall by an electronic mechanism. Two types of error, faulty discs missed and perfect discs incorrectly selected as faulty, were analyzed.

In general, a subject worked with the greatest accuracy when selecting faulty material from three lines of a 6-line convoyor, sitting opposite to another subject doing the same thing. Where they worked singly, performance on the 3-line convoyor was significantly more accurate than on the single line. The performance of subjects was influenced by the methol presentation of the material to be inspected and by working singly or in pairs.

Lipsett, L., and Wilson, J. M. Do "suitable" interests and mental ability lead to job sstisfaction? Educational and Psychological Measurement, 1954, 14, 373-380.

Report on a follow-up study of clients (N-178, 54% survey return) of the Mochester Institute of Technology's Counseling Center provided considerable information about the relationships between job satisfaction on the one hard and vocational interests on the other hand. Some of the principal findings follow:

1. There was a tendency for the respondents with the greatest job satisfaction to have occupational interests which would be classified as 'suitable' in terms of the assumptions on which the Kuder Proference Record in based (suitable-one of two highest percentile scores on Kuder corresponded to occupation).

2. Correspondingly, those clients reporting job indifference or dislike tended to have interests which would be considered "unsuitable." The Minnesots Orcupational Pating Scales were used as a criterion of the appropriateness of the Cilent's mental ability for their jobs. Findings regarding the relationship between mental ability and job satisfaction were:

1. Only 44 per cent of the counseless had levels of mental ability which were "suitable" according to the Minnesota Occupational Rating Scales.

There was a slight positive relationship between suitability

which were "suitable" according to the Minnesota Occupational Rating Scales.

There was a slight positive relationship between suitability of mental ability and job satisfaction, but, in general, this relationship was not statistically significant.

When job satisfaction was related to both interests and mental ability, a reasonably clear relationship was found to exist. It is felt, however, that for this group and with the criteria used, interests were related to job satisfaction more closely than was mental ability. All of the clients who were indifferent to their jobs or who disliked their jobs had either vocational interests or a level of academic ability which would be classified as unsuitable for these jobs.

Locke, E.A. Interaction of ability and motivation in performance. Perceptual and Motor Skills, 1965, 21, 719-725. (a)

Four studies are reported which attempted to replicate previous findings of significant interactions between ability and motivation in performance. In general, the previous findings were not strongly replicated, though there was some evidence that the effects of motivation on High Ability Ss are relatively greater than on Low Ability Ss. However, several significant motivation and ability effects were found for both Low Ability and Low Motivation Ss, respectively.

Locke, E.A. The relationship of task success to task liking. <u>Journal of Applied Psychology</u>, 1965, <u>49</u>, 379-385. (b)

Reports on 4 laboratory experiments which examine the relationahip between degree of task success and degree of liking for and satisfaction with the task. A number of different tasks, measures, and situations (word unscrambling, listing objects, and pursuit rotor) were used. Subjects were college students. In all cases there was ulear evidence for a significant (positive) linear relationship between success and measures of liking and satisfaction. The major reasons given for liking a task involved attributes of the individual's performance (e.g. improvement); reasons given for not liking a task most often involved attributes other than individual performance (e.g. improvement); reasons diven for not liking a task most often involved attributes other than individual performance (e.g., the monotony of the task).

Locke E.A. Relationship of success and expectation to affect on goal-seeking tasks. <u>Journal of Personality and Social Psychology</u>, 1967, 7, 125-134.

Examined the relationship between deviation of outcome from expectation and affect using goal-seeking tasks on which S was responsible for the outcome. Three experiments yielded a linear relationship between degree of deviation and affect, positive deviations (where S did better than expected) being valued more than negative deviations (where S did worse than expected). Now-ever, further snalyses demonstrated that it was not deviation from expectation that was responsible for the affect differences but success and failure-which were associated with positive and negative deviations from expectancy, respectively. Success produced satisfaction and the same amount of satisfaction whether it was expected or unexpected, failure produced dissatisfaction and the same amount of dissatisfaction whether it was expected or unexpected. It was suggested, contrary to mcClelland's theory, that it was the relationship of outcome to aspiration (to what 5 wants or values) rather than the relationship of outcome to expectation (or adaptation level) that determines affect.

Locke, E.A. Toward a theory of task notivation and incentives.
Organizational Behavior and Human Performance, 1968. 1, 157-190.

Summarizes and integrates research concerned with the relationship between conscious goals and intentions and task performance. The basic premise of this research is that an individual's conscious ideas regulate his actions. Studies are cited dromnstrating that:

(1) hard goals produce a higher level of performance (output) than easy goals, (2) specific hard goals produce a higher level of output than a goal of "do your best," and (3) behavioral intentions requlate choice behavior. The theory also views goals and intentions as mediators of the effects of incentives on task performance. Evidence is presented supporting the view that monetary incentives, time limits, and knowledge of results do not affect performance level independently of the individual's goals and intentions. A theoretical analysis supports the same view sith respect to three other incentives; participation competition, and praise and reproof. Finally, behavioral intentions were found to mediate the effects of money and "verbal reinforcement" on choice behavior. It is concluded that any adequate theory of task motivation must take account of the individual's conscious goals and intentions.

Locke, E.A., & Bryan, J.F. Knowledge of score & goal level of determinants of work rate. <u>Journal of Applied Psychology</u>, 1969, 53, 59-65.

Discusses problem that most previous studies of the motivational effects of knowledge of results have failed to control for differential goal setting by Ss in the different knowledge conditions. This study attempted to separate the effects of knowledge qua knowledge from those of goal setting using a 2 x 2 factorial design. The task was simple addition. Subjects were 23 male and 17 female college students. The factors were knowledge of (raw) score (KR) vs. no knowledge of (raw) score (KO KR), and hard vs. easy goals. Scores in the KR conditions were given in such a form that they could not be used to set goals. The hard-and easy-goal Ss. on the other hand, were informed only of their progress in relation to a standard set by E. It was found that the hard-goal Ss worked significantly faster than the easy-goal Ss, but the KR and Mo KR groupe did not differ in performance.

Locke, E.A., & Bryan, J.F. The directing function of goals in task performance. <u>Organizational Behavior and Human Performance</u>, 1969, 4, 35-42. (b)

Reported two studies which deal with the directing function of goals in task performance. On a pilot study, 49 subjects worked on an addition task for 20 two minute trials. On half the trials they were told to maximize the total number correct and on the other half they were told to minimize the total number of errors. On half the trials subjects were told which goal to try for (maximize correct or minimize errors). On the other trial subject chose goal. Subjects were told their scores on both dimensions after each trial.

In the second study, 30 subjects participated in three trials of driving a Rambier station wagon equipped with a drivometer around a prescribed course. On the second trial, 10 subjects were told their scores on five dimensions monitored by the drivometer and were told to fecrease accelerator reversal scores on trial 2 and to decrease steering reversals on trial 3. The second experimental group [8-10] had these instructions reversed for trial 2 & 3. A control group were not given instructions or knowledge of results.

In both studies subjects were given, on each trial, knowledge of their scores on two or more independent (uncorrelated) performance dimensions; but they set goals to maximize (or minimize) their scores on only one performance dimension. It was predicted that scores on given dimension would be higher (or lower) when the subject was trying to maximize (or minimize) his score on that dimension than when he was trying for some other goal. The predictions were generally confirmed. ally confirmed.

Locke, E.A., Cartledge, N. & Koeppel, J. Motivational effects on knowledge of results: A goal-setting phenomenon. <u>Psychological</u> <u>Bulletin</u>, 1968, 70, 474-485.

Reviews hypothemis that the motivational effects of knowledge of results (KR) were a function of the goals Ss set in response to such knowledge. Previous studies were classified into 4 categories according to the degree to which KR and goal-setting effects were separated; (a) One group of studies explicitly confounded the two variables by assigning KR and No-KR Ss different goals; (b) other studies gave KR only in relation to standards or gave S a record of his previous performance, both of which procedures probably encouraged goal setting KR Ss; (c) a Jrd group of studies did not involve any obvious manipulation of goals but the goals set spontaneously by the KR and No-KR Ss were not actually measured; (d) 4 studies which separated KR and goal-setting effects found significant relationships between goals and performance but no effect of KR per se. Other studies which gave multiple KR (based on independent performance parameters) found performance improvement to be restricted to that parameter on which S set a goal of improvement.

Lodahl, T.M. Patterns of job attitudes in two enriched assembly technologies. Administrative Science Quarterly, 1964, 8, 482-519.

Examined the job attitudes of workers in two assembly plants by applying a factor analysis to data obtained from a continuous of interviews (autà assembly-50 interviews with male workers; electronics assembly-26 interviews with female operators). For both tronics assembly-20 interviews with male workers, electronics assembly-20 interviews with female operators). For both plants the attitude variables could be described as the following three independent factors; affective components, instrumental components, and job involvement. In the auto assembly plant technological variables describing the jobs broke down into two independent factors, one dealing mainly with the variety present in the job, and the other with physical strain, mechanical pacing, and the like; these were termed variety and assembly-line syndrame respectively. In the electronics assembly plant one technological factor accounted for all the varience in jobs except that of utility operator. It was concluded that this pattern of attitude factors constitutes a replication, with different methods and a different sample, of the work of Herzberg et al., and that there may therefore he some general theoretical basis for the distinction between the "satisfiere" and "motivators" as expressive and instrumental aspects of job attitudes respectively. Finally, possibilities for changing the nature of the assembly-line job were examined.

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Any attempt to improve the auto assembly jobs would have to consider the fact that there are two technological components that call for different cures: improving the variety factor could be done by some form of job enlargement or job rotation, and the assembly-line syndrome could be alleviated by introducing some kind of self-pacing by the workers, such as bank-building or working up the line.

Lodahl, T.M., & Kejner, M. The definition and measurement of job involvement. <u>Journal of Applied Psychology</u>, 1965, 49, 24-33.

Defined job involvement, developed a scale for measuring it, and gathered evidence on the reliability and validity of the scale to learn something about the nature of job involvement through its correlation with other job attitudes. This paper describes the davelopment and validation of a scale measuring job involvement, the resulting scales, the relation between job involvement, and other job attitudes.

Lofquist, L.H., & Devis, R.V. <u>Adjustment to work</u>. New York, New York; Appleton-Century-Crofts, 1969.

This volume elaborates on the theory of Work Adjustment pub-lished by Dawis et al. (1964,1969) and uses it as a framework for Viewing contemporary social problems related to work. The espoused theoretical approach indicated ways in which vocational psychology should be developed if it is to provide a better basis for the prac-tice of vocational counseling.

Work adjustment is a process of interaction between an individual and his work environment. The theory postulates that work adjustment can be pradicted from a knowledge of the individual's work personality and the work environment.
 It provides a way of conceptualizing some of the major problems faced today such as retirement, poverty, education.
 The theory places particular emphasis on finding appropriate situations in which the counselee can utilize his abilities and satisfy his needs in the world of work, not on changing the counselee to fit that world.

Lofquist, L.H. & Dawis, R.V. Vocational needs, work reinforcers and job satisfaction. <u>Vocational Guidance Quarterly</u>, 1975, 24, 132-139.

This article presents a view of job satisfaction in the context of the broader Theory of Work Adjustment. This view requires attention to the work reinforcers in jobs, the work-reinforcer preferences (vocational needs) of individuals, and the outcome of satisfaction described in terms of specific satisfactions with the reinforcers. Measures of these concepts have been described and studies using these measures en reported to indicate their applicability.

The Theory of Mork Adjustment requires that attention also be given to correspondence between an individual's abilities and the ability requirements of jobs, and between personality style and work environment style. Correspondence between abilities and ability requirements predicts the likelihood of worker satisfactoriness; and, when one takes account of the correspondence between personality style and work environment style, the prediction of both job satisfaction and job satisfactoriness is improved. The Theory of Work Adjustment also states that the prediction of job satisfaction will be influenced by the level of individual satisfactoriness that is predicted or achieved.

Studies by the Work Adjustment Project support the predictability of job satisfaction from the correspondence of vocational needs and work reinforcers. Data for thirteen worker groups representing six different occupations show significant results for nine of the thirteen groups. The co-efficients of correlation ranged from .24 to .46. Data as yet unpublished on seven additional occupations show significant results for five of the seven occupational groups, with correlation coefficients ranging from .15 to .40. With correlation coefficients in these ranges and with the knowledge of (a) a high level of need-reinforcer (MID-ORP) correspondence and (b) a base rate of fifty percent satisfaction for the general population, it is possible to predict job satisfaction for seven out of every ten individuals by using actuarial tables.

If this approach to job satisfaction has validity, a number of implications follow from it. Individuals planning careers or chocsi-jobs should have available to them information about their own voca-tional needs and the reinforcer systems of occupations and jobs.

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Long, W. F. A job preference survey for industrial applicants. Journal of Applied Psychology, 1952, 36, 333-337.

This study was undertaken to develop a <u>Job Preference Survey</u> for use in business and industry as an aid in the placement of unskilled and semf-skilled workers. The final form of the <u>Survey</u> includes 170 paired-statement items, descriptive of six essentially independent components of work interest which are: 1. Routine--Varied; 2. Indoor--Outdoor; 3. Hazardous--Non-hazardous; 4. Sedentary--Bodily, Active: 5. Isolative--Gregarious; and 6. Precise--Approximate.

Only one of the intercorrelations among the six scales is as high as .50 while most of the others are much lower. Three of the scales were found to have internal consistency reliability coefficients in exness of .80, two well above .70, and one nearly .70. These coefficients are conservative estimates of the internal consistency of the scales and it is believed that test-retest reliability coefficients will be found to be appreciably higher.

It was suggested that an instrument such as the <u>Survey</u> Can be used profitably in job placement with reference to comparison of individual profiles with an empirical standard, or to comparison of profiles with synthetic standards based on job demands determined by job analysis. These comparisons would probably be most meaningful in terms of the range of scores made by a given proportion of the population, viz., the middle 50 per cent.

Lorsch, J. W., & Lawrence, P. R. Organization planning: Cases and concepts. Homewood, Illinois: Richard D. Irwin, Inc., 1972.

A series of relevant case material and readings in the area of organizational design. The readings provide summaries of some well known conceptual models of organizational structures and processes.

Most of the readings describe the contingency approach to organization theory. The readings include summaries of classical vs. participative models, sociotechnical vs. cognitive or decisionmaking models of organizations, the theories of Joan Woodward and James Thompson, the authors well known model, environmental factors and organizational integration, and an integrating article by Jay R. Galbraith. In reviewing these models, Galbraith concludes that "the predictability of the task is a basic conditioning variable in the choice of organizational forms."

While the authors have been careful to adopt a contingency approach and include summaries of readings by both 'personalistic' and 'structuralistic' theorists, the dilemma between the two approaches remains unresolved. Thus, according to the structuralists' approach the really dynamic element in organizations is the structure, arrangement and content of jobs people perform while the psychological approach to organization starts with the analysis of organizational problems and issues with the framework of interpersonal relationships within and between groups. These two general frames of reference represent a division in the emphasis which shows no signs of abatement. Needless to say, these two emphases are not mutually exclusive. Both have merit. The contingency approach, advocated by the authors, suggests that the application of the structuralists' versus the inter-personal analysis should depend upon the nature of the problem.

Lorsch, J.W., & Morse, J. J. Grganizations and their members: A contingency approach. New York: Harper & Row, 1974.

Report of a study exploring how the personal characteristics of organization members can be brought into the contingency theory of organizations. Ten units were selected for study: four manufacturing plants and six research laboratories. Five companies were effective performers and five matched units were less effective.

Results indicated that a three way fit between internal environment (individual's system environment) external environment (individual's system environment) external environment (information about market, technological economic and scientific factors relevant to the organizations purpose of profitable operations) and members personality dimensions (integrative complexity tolerance for ambiguity, attitude toward suthority, and sense of competence) is related to effective unit performance and rewards for individual members in terms of their feelings of competence.

Three possible reasons for the association between unit performance and an individuals feeling of competence are reviewed (1) individual feelings of competence before joining unit and these feelings sustained (2) feedback from effective unit performance (3) three way fit lead to feelings of competence.

Implications of the study and results for management practice and research administration, organizational design leadership, personnel selection and broader social issues are explored.

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Lovely, L. Modular work plan produces many pluses at KP. <u>Kodakery</u>, 1972, 30, 3-4.

Popularly written article discusses the development and advantages of the new 'module' system used in many departments at Eastman Kodak. A module consists of seven workers who are given responsibility in dividing work to meet production goals, as well as many other responsibilities formerly reserved for foremen. In addition to increased participation in decision making, each man now performs a variety of jobs, and in the case of inspection, the overall quality is better than when inspectors were 'specialists'. Each module has a head operator, who has taken on many of the foreman's former responsibilities, including lighting machine rooms for repairs, making product and order changes, coordinating work flow, and assisting in making merit review. Advantages cited are: "increased production, improved product quality, lower costs, reduced absenteeism and tunnover" as well as lowered training costs (the men train each other), and the module looks to be an excellent testing ground for management capability. The added efficiency and increased responsibility and skills have also made it possible to increase many wage grades. Most of the evidence is ancedotal.

Lupton, T. Efficiency and the quality of work life: The technology of reconciliation. Organizational Dynamics, 1975, 4, 68-80.

Describes a project team consisting of two social acientists, engineers, and accountants who had the task of redesigning a new manufacturing process for a mass-produced article with an output of approximately 1,000 units per week.

The team mettled upon six possible alternative designs ranging from a single operator performing the function completely by himself through a completely manned assembly line where the speed will be determined by the machines and conveyors.

will be determined by the machines and conveyors.

In order to include the desires of the workers, Turner and Lawrence's five factors of variety, autonomy, responsibility, interaction, and completeness of task were used as the basis for constructing profiles of the job requirements for each of the six alternatives manufacturing systems. This resulted in profiles for each of the six alternatives, which could be compared with the conception of what could be an adequate quality of work life. The next step was to use these same five factors to determine job expectancies. Ideally, the workers themselves would have filled out the rating form, but this was not possible in this situation. Instead, senior managers and foreman gave their views on the expectancies of the operators. The project team also rated their expectations on the five factors. In each case, the foremen believe the workers' expectations were lower than those of either the managers or the project teams observations. Cost considerations rule out the first two niternatives and the task was then to reconcile the conflicts between efficient, economic organization and the quality of work life considerations. The total project took approximately six months to complete, which indicates that it is possible to consider jointly both economic efficiency and the quality of work life when designing new manufacturing operations. It would require future work to determine if the actual production system is successful.

Luthama, F., & Reif, W.E. Job enrichment: Long on theory, short on practice. <u>Organizational Dynamics</u>, 1974, 2, 30-43.

Reports on survey of random sample of 300 of the top 1000 Fortune Industrial companies. Response rate was 42-44% (125 companies). Only 4% of companies (N-5) had made any formal systematic attempt to enrich jobs. These 5 companies were large high technology industries. One out of every four firms (N=32) that responded stated they practiced job enrichment on an informal basis.

Survey results indicated that the typical firm using a form of job enrichment originally adopted the program to improve employee performance and satisfaction; used the qualifications of available personnel as the major criterion for selecting the jobs to be enriched; applied job enrichment mainly to hourly employees in the production/operations area and to first-level supervisory personnel; and believes it has benefited from improvement in employee performance and job satisfaction but has made little effort to formally evaluate the effectiveness of the program, depending on impressions and anecdotal evidence, rather than quantifiable data, for its comclusions. Overall, most firms currently practicing job enrichment seem to have a rather limited understanding of the concept, are unsure of how or where to apply it, and have only a vague notion of what to expect from it or how to evaluate it.

Two principal reasons appear to account for the slowness of job enrichment in catching on: First is the conviction that job enrichment doesn't pay off in economic dividends: the second is the belief that the proponents of job enrichment have greatly exaggrated the psychic dividends that employees derive from job enrichment.

An analysis of its base in motivational theory indicates that part of the problem lies in the oversimplification and overgeneralization of the two-factor theory (Herzberg); and a process motivational theory (Wroom, Porter, & Lawler) seems to lead to better understanding, but its applicability is limited.

Lynch, B.P. An empirical assessment of Perrow's technology construct. <u>Administrative Science Quarterly</u>, 1974, 19, 338-356.

Current investigations on the influence of technology upon other organizational variables have remained exploratory because there is disagreement over the boundaries of the construct and there is a dearth of valid and reliable measures of technology. This study develops a measure of technology that could be used for comparative purposes. It also develops a seven-item scale that provides a valid and reliable measures of Perrov's technology construct. The scale discriminates among the technologies of functional departments in three scademic libraries.

MacGregor, J. The honor system. Wall Street Journal, May 27, 1970.

Studies methods instituted at the Alcan Aluminum Corp. at Oswego, New York (with rolling mill operators) to counter problem of high rate of absenteeism and terdiness. Time clocks were resoured and production jobs were designed to give workers unusual freedom and decision-making responsibilities. Salaries were quaranteed during absences or layotfs and blue-collar workers ers were given the same benefit programs as white-collar workers. Results showed that tardiness and turnovers were almost nonexistent and absenteeism ran about 2.5% as compared to an industry average of 10%. Productivity was increased. Human results showed that with identification with an employer, crosstraining of jobs, and inspection of own work, monotony was relieved, and employees took considerable interest in their jobs and their company.

MacKinney, A.C., Mernimont, P.P., 6 Galitz, W.O. Has specialization reduced job satisfaction? <u>Personnel</u>, 1962, <u>19</u>, 8-17.

Brief review of literature relating job socialization and job satisfactions. Concludes that issue is far from settled. Some suthorities insist that specialization is markedly reducing job satisfaction. According to these writers, job specialization has produced workers who are mentally dull, frustrated, deprived, insecure, afraid, and smothered in snonymity--people who have lost all self-esteem. In general, the members of this school of thought advocate that industry make use of such practices as job rotation, job enlargement, greater freedom for the individual worker, and arrangements designed to increase social integration on the job. Through these means, they feel, the worker will once more become happy at his job, and his pride, security, and self-esteem will return.

On the opposing side are equally respectable authorities who do not believe that job dissatisfaction is necessarily the result of specialization. The average worker today, they argue, is content and secure, and enjoys the highest standard of living in history. What dissatisfaction does exist—and this is characteristic of only about 13 per cent of all workers—is the result of factors other than specialization.

Where, then, do we stand? What can we conclude from the ovidence reviewed above? Undoubtedly, the most striking fact about this review is the lack of any really rigorous evidence on the subject. To be sure, it has inapired numerous reports; but few of these can stand the test of scientific scrutiny. Even the best studies are not completely conclusive. Still waiting to be carried out is the study that works into the job situation, actually manipulates the content of jobs for experimental purposes, and includes carefully worked out measures of job satisfaction that are applied both before and after this samioulation.

As the authors of this article sen it, the best snewer yet proposed to the problem of job satisfaction is vocational counseling, scientific selection and placement, and personnel development. These procedures, hand in hand with more rigorous research and more enlightened management practices generally, still seem to offer the best home of increasing the satisfaction that workers derive from their jobs.

Maher, J., Overbagh, W., Palmer G., & Piersol, D. Enriched jobs mean better inspection performance. <u>Industrial Engineering</u>, 1969, 23-26.

Reports on changes in inspection work at one IEM manufacturing plant. Step by step quality inspection was eliminated. A final inspection department was established staffed by qualified inspectors. These men were assigned to the enriched job of machining quality analysts. Similar changes were made in the supplier quality assurance department. Report includes limited data for conclusion that job enrichment resulted in improved attitude toward job and company and improvement in performance and the efficiency of the quality assurance departments. Author admits that the lack of control group limits the interpretation of results.

Mater, J.R. New perspectives in job enrichment. New York: Van Sostrand Reinhold, 1971.

Collection of eleven chapters written by managers consultants and professors. A variety of viewpoints and styles combine to offer a comprehensive picture of job enrichment. Some selections described case studies of carefully designed job enrichment projects related to a theoretical basis. Book critically avaluates success of these programs, workers and supervisors attitudes and effects on job satisfaction. Mahoney, T.A., & Frost, P.J. The role of technology in models of organizational effectiveness. Organizational Behavior and Human Performance, 1974, 11, 122-128.

Developed an operational definition of technology building from a typology of technologies proposed by J.D. Thompson. Analysis was conducted on 297 organization units from within a diverse sample of 17 business and industrial firms.

The organization units were classified among three varieties of technology, specified as long-linked, mediating and intensive technology respectively (following the J.D. Thompson typology). The organization units were also described in terms of several dimensions of organizational behavior developed in earlier research. Direct and indirect relationships involving technology, 14 dimensions of organizational behavior, and organization unit effectiveness, were investigated in several analyses.

The findings from these analyses support the hypothesis that the criteria of effectiveness of an organization unit vary with the nature of the technology of the unit. The nature of the intratechnology models of organizational effectiveness are generally supportive of the variation expected from the Thompson theoretical analysis. No direct technology-organizational effectiveness relationship was observed, a finding which is in keeping with the expectations of the researchers.

The models of organizational effectiveness observed within each of the three technology categories are described and the implications of their differences and similarities are discussed.

Mann, F.C., 4 Hoffman, R.L. Individual and organizational correlates of automation. <u>Journal of Social Issues</u>, 1956, 12, 7-23.

The introduction of automation into a power plant produced major effects on its organizational structure and on the attitudes of the workers toward their jobs. Maintenance was centralized for the entire system. Fewer levels of supervision were required for the smaller work force in the new plant. Job enlargement and rotation resulted in greater job interest and satisfaction, but also in a higher tension level on the job. The effects of continuous operation on the workers' lives were generally found to be negative. Automation, introduced in a different aituation and in a different way, will presumably have different effects.

Mann, F.C., & Hoffman, R.L. <u>Automation and the worker: A study of social change in power plants</u>. Hew York: Henry Rolt, 1960.

Factual examination of the impact and implications of technological change on work systems.

This report is based on a comparison of two power plants within the same company—one containing the most recently developed, highly sutomated equipment, the other a modern though less automated, plant.

Results indicated that in the automatic plant as compared to the older plant, production used less than half the personnel required by older plant. Top rated jubs paid 17 cents more an hour. Maintenance functions were centralized and maintenance craft distinctions were eliminated. Content of most jobs was chlarged. Morkers expressed greater security and satisfactions there was a reduction of one level of supervision, isolated jobs were eliminated which brought about greater group cohesiveness. Poremen acted more affectively and job rotation allowed each worker to master several jobs.

Authors warn against overgeneralization as power plant technology differs from other kinds of technology. Authors stress that human organization in industry is based on technology and other technologies vary. Secondly authors warn that preoccupation with machines and automation neglect the crucial and delicate interactive balance between technical and social systems.

Mann, F.C. & Williams, L.R. Gome affects of the changing work environment in the office. <u>Journal of Social Issues</u>, 1962, <u>18</u>, 90-101.

Reports findings from a study of a change over to electronic data processing (EDP) in the accounting functions of a large electric power company. The change over occured from 1954-1959 and involved 700 employees and supervisory personnel.

Results indicated that automation created a greater degree of interaction among members of a work group, required a greater understanding of the total system, involved greater amount of error risk, and allowed for detection of errors traced back to specific individuals. Even though workers had more interesting end challenging jobs, the greater exposure to risk and the tighter performance standards negated the so-called attractive aspects of job enlargement.

Workers did not express increased satisfaction with their jobs as a whole. The office workers felt that top management not only expected more of them but was less interesting in them as individuals, Significantly higher proportions of these white-collar workers believed their future looked somewhat worse and they were worried about the possibilities of temporary layoffs or losing their jobs. They also showed evidence of psychological and physical anxiety and some had actively searched for other jobs.

Marks, A.R.N. An investigation of modifications of job design in an industrial situation and their effects on some measures of economic productivity. Unpublished doctoral dissertation, University of California, 1954. (Summarized in L.F. Davis & R.R. Canter, Job design research. <u>Journal of Industrial Engineering</u>, 1956, 2, 275-282)

Reports a study of 29 female employees in the manufacturing department of a company on the West Coast. A similar department was monitored as a centrol. Production was poorer with enlarged jobs, but quality improved. After experience with the enlarged job, some workers disliked the lack of personal responsibility of an assembly line design. The conclusion, however, which is normally drawn from this study is that enlarged jobs are better.

Quality improvement would be expected in nearly all programs of job enlargement since the worker serves as his own inspector. If he makes a mistake and discovers it he can repair it on the spot. Such repairs on assembly line work are, of course, immpossible since the worker cannot stop to make the repairs. This improvement in quality, however, should be regarded as a direct result of the technical changes in the jobs and not of changes in worker motivation or satisfaction. estisfaction.

Marquardt, L.D., & JacCormick, E.J. Attribute ratings and profiles of the job elements of the Position Analysis Questionnaire (PAO). Technical Report No. 1, June 1972, Contract Non: N00014-67-A-0226-0216, Purdue University, Office of Naval Research.

The primary purpose of this study was to obtain estimates of the human attribute requirements of the job elements of Form B of the Nosition Analysis Questionnaire (PAQ). A secondary purpose was to explore the reliability of job-related ratings as a function of the member of raters. A taxonomy of 76 human attributes was used, and ratings of the relevance of these attributes to each of the PAQ job elements were obtained. A minimum of 8 raters and a maximum of 11 raters rated each of the attributes. The mean and median ratings for each attribute as it related to each job element were computed, these serving as the basis for the attribute profiles of the job elements. Measures of the reliability of the ratings were also obtained. The conclusions drawn from these analyses were: (1) Raters are able to rate the relevance of human attributes to the job elements in a structured job analysis instrument such as the PAQ, and do so with respectable reliability; and (2) a large number of human attributes appear to be relevant to one or more of the job elements of the PAQ, with some attributes being relevant to more job elements of the PAQ, with some attributes being relevant to more job elements than others. The implications drawn from these conclusions were: (1) the attribute profiles of the job elements of the PAQ and (2) in turn, such profiles in such as for determining the attribute requirements of jobs, through job analysis with the PAQ and (2) in turn, such profiles might be of use in the establishment of the synthetic validity of tests for use in personnel programs. The determination of the reliability of the ratings as a function of the maker of raters was accomplished through the use of the Spearsan-Brown formula, and this analysis resulted in the conclusion that 8 to 10 raters usually would provide ratings of reasonably adequate reliability. adequate reliability.

Marquardt, L.D., & McCormick, E.J. The job dimensions underlying the job elements of the Position Analysis Questionnaire (PAC) (Form B). Technical Report No. 4, June, 1974, Contract Monr MODO14-67-A-0226-0016-NR 151-331, Purdue University, Office of Naval Research.

This study was concerned with the identification of the job dimens/on underlying the job elements of the Position Analysis Surzidonnaire (PAO). Form B. The PAO is a structured job analysis inntrument consisting of 187 worker-oriented job elements which are divided into mix a priori major divisions. The statistical procedure of principle components analysis was used to identify the job dimensions of the PAO. Forty-five job dimensions were identifying the procedure of principle component analysis was used to identify the job dimensions of the PAO. Forty-five job dimensions were identified the procedure of the statistical proportion of the major dimensions are mitted from 7 independent analyses. Thirty-one of themse dimensions remulted from 7 independent analyses using, in each case, only the job elements from one of the major dimensions of the PAO. The remaining 1d dimensions resulted from an oversall analysis in which all of the PAO job elements were used simultaneously. These job dimensions accounted for a substantial portion of the variance associated with the data, the percentage ranging from 51% to 63% for the several component analyses performed. The 45 job dimensions which were identified might be viewed as representing groups of job elements which tend to occur tegether on jobs, and, since the sample upon which then to occupational composition or the Jabor force, these job dimensions would be relatively representative of the couplings of such job characteristics of jobs in general. Since provious work with the PAO has shown that job dimensions derived from PAO-based data do have some practical utility for solving various personnel type problems in organizations, it is expected that the job dimension identified in the present study will also prove to be of practical utility.

Marquardt, L.D., & McCormick, E.J. The utility of job dimensions based on Form B of the Position Analysis Questionnaire (PAQ) in a job component validation model. Technical Report No. 5, July 1974, Contract Monr MODIA-67-0276-0016-NR 151-331, Purdue University, Office of Maval Research. (b)

This study involved the use of a structured job analysis instrument called the Position Analysis Questionnaire (PAQ) as the direct basis for the establishment of the job component validity of aptitude teats (that is, a procedure for estimating the aptitude requirements for jobs strictly on the basis of job analysis data). The sample of jobs used consisted of 658 jobs for which PAQ analyses were available that were "matched" with 141 jobs for which the United States Training and Employment Service had published test data for job incumbents for the 9 tests of the General Aptitude Test Battery (GATB).

Job dimension scores (based on principal components analyses of PAQ data) were derived for the 658 jobs, and were used as predictors. The criteria were developed for each of the 141 "matched" jobs, these being based on the scores of the job incumbents, on the 9 tests. These were: (1) mean test score; (2) a score one standard deviation below the scan (called a potential cutoff score); (3) a validity coefficient. The results generally supported evidence from provious studies that data based on a structured job analysis procedure can be used for establishing the job component validity of aptitude tests, thereby eliminating the need for conventional test validation procedures in many situations.

Maslow, A.H. A theory of human motivation. Psychological Review, 1943, 50, 370-396.

Summary of theory of motivation.

- There are at least five sets of goals, which we may call basic needs. These are briefly physiological, safety, love, esteem, and self-actualization.
- (2) These basic goals are related to each other, being (2) These basic goals are related to each other, being arranged in a hierarchy of prepotency. This means that the most prepotent goal will monopolize consciousness and will tend of itself to organize the recruitment of the various capacities of the organism. The less prepotent needs are minimized, even for-gotten or denied. But when a need is fairly well satisfied, the mext prepotent ('higher') need emerges, in turn to dominate the conscious life and to serve as the center of organization of behavior, since gratified needs are not active motivators.
- (3) Any thwarting or possibility of thwarting of these basic human goals, or danger to the defenses which protect them, or to the conditions upon which they rest, is considered to be a psycho-logical threat. With a few exceptions, all psychopathology may be partially traced to such threats. A basically thwarted man may actually be defined as a 'sick' man, if we wish.
- (4) It is such basic threats which bring about the general mergency reactions.

Maslow, A. H. Eupsychian Management, Homewood, Illinois: Richard D. Irwin/The Dormey Press, 1965.

The book describes the interrelationships between psychological theory and an enlightened modern management. Eupsychian means good psychological management. The book is a journal of first impressions and desponses of Maslow who is a theoretical psychologist, looking at the industrial sector of society.

He enumerates the following assumptions which underlie eupsychian management. These assumptions are a combination of theories by Drucker, Likert, McGregor, Argyris, and Others.

- chian management. These assumptions are a combination of less by Drucker, Likert, McGregor, Argyris, and Others.

  (1) Assume everyone is to be trusted.
  (2) Assume everyone is to be informed as completely as possible of as many facts and truths as possible.
  (3) Assume that gour people the impulse to achieve.
  (4) Assume that there is no dominance subordination hierarchy.
  (5) Assume that everyone will have the same ultimate managerial objectives and will identify with them no matter where they are in the organization or in the hierarchy.
  (5) Rupsychian economics must assume good will among all the members of the organization rather than rivalry or jealousy.
  (4a) Synergy is also assumed. Synergy can be defined as the resolution of the dichotomy between selfishness and unselfishness, or between selfishness and experience of the organization is healthy enough, whatever this means.
  (5) Assume that the individuals involved are healthy enough.
  (6) Assume that the organization is healthy enough, whatever this means.
  (6) Assume that the organization is healthy enough, whatever this means.
  (7) Assume that the organization is healthy enough, whatever this means.
  (8) Assume that the people in eupsychian plants are not fixated at the safety-need level.
  (1) We must assume that the people in eupsychian plants are not fixated at the safety-need level.
  (1) Assume an active trend to self-actualization—freedom to effectuate one's own ideas, to select one's own friends and one's own kind of people, to "grow," to try things out, to make experiments and mistakes, etc.
  (12) Assume hostility to be primarily reactive rather than character-based, i.u., that it will be for good, objective, present, herenow reasons and that is is therefore not to be actified and discouraged.
  (14) Assume that people can take it, that they are tough, attended the mean assumes that people are improvable.

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- (16) Assume that everyone prefers to feel important, needed, useful, successful, proud, respected, rather than unimportant, interchangeable, anonymous, wasted, unusual, expendable, disrespected.

  (17) That everyone prefers or perhaps even needs to love his boss (rather than to hate him), and that everyone prefers hoss to disrespect him).

  (18) Assume that everyone with than to disrespect him, the likes fuaring anyone; but fearing anyone (more than he likes fuaring anyone), but fearing anyone (more than he likes fuaring anyone), but he prefers fearing the hoss to despising the hoss.

  (19) Eupsychian management assumes everyone prefers to be a prime mover rather than a passive helper, a teel, a cork tossed about on the waves.

  (20) Ansume a tendency to improve things, to straighten the crooked picture on the wall, to clean up the dirty mess, to put things right, make things better, to do things better.

  (21) Assume that growth occurs through delight and through boredom. That is, that the parallel with children's growth is fairly sound.

  (22) Assume that is, that the parallel with children's growth is fairly sound.

  (23) Assume that ing or an implement, or tool, or 'hand.' A person prefers to use all his capacities, to fies all his muscles and resents being treated as just a part of the person.

  (23) Assume the proference for working rather than being idle.

  (24) All human primerence for working rather than being idle.

  (25) Ansume the proference for pursonhood, uniqueness as a person, identity (in contrast to being anonymous or interchangeable).

  (26) We must assume the wisdom and the efficacy of self-choice.

  (27) We must make the assumption that the person is courageous enough for eupsychian processes.

  (28) We must assume the visdom and the efficacy of self-choice.

  (29) We must assume the visdom and the efficacy of self-choice.

  (29) We must assume the visdom and the efficacy of self-choice.

  (29) We must assume the visdom and the efficacy of self-choice.

  (29) We must assume the visdom and the efficacy of se

McCormick, E.J. The application of structured job analysis informa-tion based on the Position Analysis Questionnaire (PAQ). Technical Report No. 9, October 1974, Contract Nonr N00014-67-A-0226-0016-NR 151-331, Purdue University, Office of Naval Research.

This report is the final report based on the contract referred to above. In large part it is a summary of the several studies that have been carried out under the provisions of this contract. All of these studies have involved the use of the structured job analysis procedure called the Position Analysis Questionnaire (PAQ). This job analysis instrument consists of 187 job elements organized into six divisions. In the analysis of a job with the PAQ the relevance of the individual elements to the job are rated using any of several rating scales such as importance, time, etc.

- The several studies carried out included the following: The rating of the relevance to the individual job elements of the PAO of each of 76 attributes, this resulting in an attribute pro-file for each of the job elements. A series of principle components analyses of these attribute
- profiles
- profiles. A series of principle components analyses of data for a sample of 3700 jobs, this resulting in the identification of 30 "divisional" job dimensions, and 14 "general" (G) job dimensions. The use of data based on the PAQ in the context of job component validity (that is, the statistical estimation of aptitude requirements for jobs on the basis of job analysis data). The use of data on the PAQ for the estimation of compensation rates of tobs.

- of jobs. The use of a special Navy version of the PAO for the analysis of compensation relevant to enlisted billets on three sircisft carriers and in air squadrons (in particular, a comparison was made of the relationship between the compensation for enlisted personnel as compared with the compensation that would be appropriate for jobs in the civilian labor market with corresponding characteristics. The development of job clusters based on 2 clustering procedures (the BC-THY and the CODAP procedures).

  The analysis of the relationship between job characteristics, personal interests, and response dispositions of individuals as related to job satisfaction (this study being carried out with jobs and job incumbents in the telephone industry).

In general terms, the results of these several studies lend further support for the use of data from structured job analysis procedures for various personnel-related objectives.

McCormick, E.J., Cunningham, J.W., & Thorton, G.C. The prediction of job requirements by a structured job analysis procedure. Personnel Psychology, 1967, 20, 431-440.

Reports results of two studies that correlated an attribute score derived from job analysis information and a "trait" requirement as published by the U.S. Employment Service, using a sample of 401 jobs in Study 1. Study 2 correlated the attribute score with 43 job specialities from the Navy. Results showed that it may be possible to establish 'bridges' between various job characteristics and their corresponding human-attribute requirements, strongly suggesting the possibility of some generalized system of synthetic validity.

McCormick, E.J., DeNisi, A.S., & Marquardt, L.D. The derivation of job compensation index values from the Position Analysis Questionnaire (PAQ). Technical Pepprt No. 6, September 1974, Contract Norn N00014-67-A-0228-0016-NR 151-331, Purdue University, Office of Naval Research

(PAO). Technical Report Ro. 6, soptember 1974, Contract Ronr Bouvar67—A-0726—0016—NR 151-331, Purdue University, Office of Naval Research.

This study deals with what is called the job component method of establishing compensation rates. This method is predicated upon the use of a structured job analysis procedure that providen the basis for quantifying various components of jobs, and the subsequent use of such data as the direct basis for deriving an index of the "compensation" value of any given job in relation to the compensation rates for a large and varied sample of jobs. The basic job analysis questionnaire used in the study was the Position Analysis Questionnaire (PAO) (Form B). On the basis of a principal components (called job dimensions) were identified. Scores on these dimensions, and the ratings on the original individual elements of the PAO, were used in a multiple regression procedure for predicting the actual compensation rates of the jobs in the sample. The nample consisted of 2683 jobs. This total sample was divided into two subsamples, and a double cross-validation procedure was followed. The results of the analyses generally supported provious related research to the effect that compensation rates for jobs might be established on the basis of quantitative job analysis data from a structured job analysis procedure, thus possibly avoiding the usual job ovaluation procedures. However, the level of prediction of compensation rates in the present study was not as high as it was in a previous parallel study, hased on a smaller sample. The lower level of prediction in this study probably can be attributed in part to the volatile nature of wages and salaries in the time period during thick such data were obtained for the study was not as high as it was in a previous parallel attributes and such as high as it was in a previous parallel attribute of wages and salaries in the time period during the how the volatile nature of wages and salaries in the study probably can be attributed in part to the vol

McCormick, E.J., Jeanneret, P.R., & Necham, R.C. A study of job characteristics and job dimensions as based on the Position Analysis Questionnaise (PAQ). <u>Journal of Applied Psychology Monograph</u>, 1972.

Completed a factor analysis of data on "worker-oriented" jobelements for 536 jobs, as based on data from the Position Analysis
Questionnaire (PAQ), a structured job-analysis questionnaire. This
analysis resulted in the identification of reasonably meaningful jobdimensions of human behaviors. A tested hypothesis that communality
across jobs based on similar behaviors should have implications in
terms of common aptitude requirements and corresponding rates of pay.
The results indicate that aptitude requirements and rates of pay can
be predicted reasonably well from such quantified job-analysis data,
thus suggesting that conventional test-validation and job-evaluation
procedures might sometimes be eliminated.

McDonald, B.W. Correlates of job satisfaction aboard Navy ships. Proceedings of the 40th Annual American Psychological Association Convention, 1972, Z., 635-636.

Obtained personal history, military status, job satisfaction information and health opinion survey data on 3,296 non-rated (no job speciality) and 2,555 rated Naval enlisted men aboard six ships.

Results indicated that satisfaction was positively correlated with age, length of service, pay grade and number of men supervised. Satisfaction was negatively related to level of education, socio-economic status of parents, number of close co-workers, health opinion survey, and number of dispensary visits.

Satisfied men tended to be married and have dependents. Higher satisfaction was reported by men who worked in clerical, cook/steward or ordinance jobs. Men on temporary duty or deck assignments reported lowest job satisfaction.

A multiple regression correlation of .49 was obtained between six variables (type of duty, length of service, specific ship, health opinion survey score and number of co-worker) and the criterion job satisfaction.

McDonald, B.W., & Gunderson, E.K.E. Correlates of job satisfaction in Naval environments. <u>Journal of Applied Psychology</u>, 1974, 59,

Demographic, military status, job-related and health-related variables were correlated with a job satisfaction measure for 5,851 Navy enlisted men. Health-related variables were most highly correlated with satisfaction, followed by type of job and seniority. A multiple regression equation with six variables (symptom index, type of job, length of service, specific ship, number of men supervised, and worked closely with others! yielded a cross-validity coefficient of 49. The results indicated some important correlates of job satisfaction in the Naval environment and suggested hypotheses for further investigation.

4. 4

McFarling L.H. & Heisstra N.W. Pacing, product complexity and task perception in simulated inspection. <u>Human Factors</u>, 1975, <u>17</u>, 361-367.

This investigation examined obtential performance or motivational differences between self-paced and machine-paced inspection tasks, and yeasured subjects perceptions of inspection tasks. Twenty women served as inspector in the investigation. Subjects in both self-paced and machine-paced conditions inspected simulated printed circuits varying in circuit comolevity. Performance measures of defect detection rate, false alarm rate, and the required for decision were recorded. Self-paced subjects performed better, but took longer. Both groups suffered performance decrements on the more complex circuits. Both groups found the task basically dull and uninteresting. Subjects in the self-paced condition rated the task as more controllable, interesting, and important than did machine-paced subjects. Subjects in the machine-paced task condition rated the task as slightly more demanding and repatitive than did their self-paced counterparts. Overall, the task descriptor ratings indicate that both self-paced and machine-paced subjects perceived the inspection task as being relatively unpleasant, but the machine-paced subjects tended to have more negative perceptions of the task.

The results of this investigation confirm the important influence of product complexity on inspection performance, at least if complexity is defined as the number of items, components, or notential targets per product to be inspected. If similar inspection strategies are utilized for varying degrees of complexity, it would be expected that as product complexity increased so would the time required for inspection of the item. Similarly, if an inspector is operating at some constant level of efficiency, it might be expected that as complexity increased, so would the number of possibilities for inspector error. The results of this investigation support such an interpretation.

The effect of pacing conditions probably involves several factors. The self-paced inspection situation appears to possess advantages with respect to both performance and motivational aspects. The results of the present investigation suggest that a self-paced situation may be structured to encourage accuaracy rather than speed and still realize a reasonable level of total task accomplishment. In contrast, a machine-paced situation may tend to emphasize speed in decision making even then sufficient time does exist to conduct accurate inspection. As evidenced in this study a situation of this type may result in less accurate defect detection performance. If a machine-paced situation is also perceived by its participants to be more demanding and uncontrollable, and less interesting or important than a self-paced task of the same nature, the differing motivational structures of the task could also contribute to poor-

In most actual work situations, product complexity remains constant and does not lend itself to manipulation to improve inspector efficiency other than multiple inspections, component inspections, or the use of hardware aids. The pacing of the inspection task, on the other hand, may be arbitrary or at least optional in some work situations. If this is the case, the results of this investigation suggest that a self-speced inspection option could prove advantageous to quality control efficiency.

McKenna, K. Mational malady: Boredom on the job. <u>Democratic</u> and <u>Chronicle</u>. <u>Pachester</u>, N.Y. Sunday, June 4, 1972. Section F pp. 1 6 4.

Reports on pervasive attitude of boredom and dissatisfaction among American workers. Liets following ten most boring jobs: assembly line workers, elevator operator, pool typist, bank guard, copy machine operator, keypunch operator, highway toll collector, cast watcher in tunnel, file clerk, and housewife. A self quis is included to allow individual to rate how bored he is with his job. The source of the 10 most boring jobs or the self questionnaire is not indicated.

Concludes that when workers achieved job security and sufficient pay they desire self fulfillment.

McLaurin, W.A. Bishop, G., & Bell, J. Otic IQ and information processing rate in a work-paced and self-paced task. <u>Perceptual</u> and Motor Skills, 1972, 15, 863-886.

Tested previous result that self-pscing enhances performunco of perceptual-motor tasks. To determine whether self-pacing
would increase the observed relationship of information-processing
rate with measures of intelligence, II metched pairs of students,
motched for Otis IQ, were randomly assigned to a Work-paced or
Self-paced simple arithmetic task. The relationship of the mean
response latency to Otis IQ was moderate in each group. However,
there was no significant difference between groups in the magnitude of relationship, Self-pacing did not enhance the relationship. The magnitude of the relationship with Otis IQ was relatively high considering the complexity and duration of the arithmetic test.

RcMenus, G. J. Job enlargement is worth checking. Iron Age, 1956, 127, 50-52

Discusses some of the basic rudiments of job enlargement, pointing out possible benefits, but also cautioning against complete endorsement, especially when direct labor is concerned. Oftentimes, job enlargement programs invite union trouble. Some of the possibilities of job enlargement include money savings, greater work efficiency, greater employee interest, increased responsibility, meaningful and purposeful functions for the worker, greater production flexibility, and increased job satisfaction. Reports briefly on job enlargement programs at IBN and Detroit Edisc.

McWhinnoy, M.R.H., & Adelman, S.R. Hental health of the industrial worker: An analysis and review. <u>Human Organization</u>, 1966, 25, 180-184.

Reevaluates Kornhauser's (1962) conclusions that large numbers of automobile workers manifest feelings, attitudes and behaviors that signify unsatisfactory life adjustment and poor mental health, that the lower the occupational level the poorer the mental health and that the cause of poor mental health is the occupation or work itself.

McWhinney and Adolman conclude from their reanalysis that there is no visible relationship between occupation level and mental health when pre-job characteristics have been controlled for. Their analysis indicated that a noticeable portion of the variation in mental health could be explained by a seemingly permanent condition induced by experiences or conditions which satedate the current work environment.

Kornhauser's rejoinder, (which is included in the article) concluded that both personal characteristics and conditions of job and life are related to mental health. A major finding is that routine lower level jobs are primarily responsible for poorer mental health and cannot be explained purely in terms of personal determinants without the inclusion of situational work factors.

Mecham, R.C., Harris, A.F., McCormick, E.J., & Jeanneret, P.R. Job Activity Preference Questionnaire (JAPQ). Lafayette, Indiana: Purdue Research Foundation, 1972.

The JAPO is an interest inventory that provides for the expression of interests in the job elements of the Position Analysis Questionnaire, which is a structured job analysis instrument. The questionnaire is divided into 9 sections, each of the sections containing a listing of work situations. For each section, there is a rating scale used to indicate the desirability of the situations designated.

Moier, D.L., & Bell, W. Anomia and differential access to the achievement of life goals. <u>American Sociological Review</u>, 1959, 24, 189-202.

Reports a post-factum analysis of data obtained from selected probability samples from four consus tracts in San Francisco in 1951. Final sample consisted of 701 males aged 21 or over. Responses to Srole's Anomia Scale were dichotomized into high and low scores and were related to a number of demographic characteristics obtained from the census. A post-factum analysis leads to a single generalization, namely, that anomia results when individual lack access to means for the achievement of life quals. Lack of opportunity to achieve life goals follows mainly as a result of the individual's position in the social structure as determined by numerous factors; occupation, education, income, acclass identification, participation in formal organizations and in informal groups, social mobility, marital status, and religious preference. Each of those factors is related to anomia. A multidimensional Index of Access to Means for the Achievement of Life Goals was constructed by using the above variables. Of those individuals receiving an index score of 7 (high access) only 10 percent have high anomia scores; whereas, of those persons receiving an index score of 0 (low access) 100 percent have high anomia scores.

Meir, E.I., & Barak, A. Pervasiveness of the relationship between intrinsic-extrinsic needs and persistence at work. <u>Journal</u> of Applied Psychology, 1974, 22, 103-104.

Reports results from 1,027 persons from 10 different occupations who responded to inventories of intrinsic and extrinsic needs. While pergistence at work was positively correlated with intrinsic needs, no correlation was found with extrinsic needs. These findings were generally consistent ecross occupations. The criterion persistence at work was defined vaguely as % of total number of sonths elapsed since graduation.

Moissner, M. <u>Technology and the worker: Technical demands</u> and social processes in <u>industry</u>. San Francisco: Chandler Publishing Company, 1969.

Reanalyzes the data from 18 previous studies and reports on the behavioral adaptations that were found to be associated with varying technological restraints such as cooperation, either required or permitted; hand transfer for moving or transporting materials or equipment; machine tools to help with transfer; a "doadline" transfer process; a "live-line" transfer process, and combinations of these restraints.

BOOK TO A PROPERTY

Meissner, M. The long arm of the job: A study of work and leisure Industrial Relations, 1971, 10, 239-260.

Reports the results of an interview survey of 206 blue-collar industrial workers which disclosed a consistent negative relationship between technical constraints and social interaction while actually working. The relationship between greater technical constraint, machine pacing, spatial confinement, task dependence and work type on the job and decreased participation in voluntary organizations was strongest for average number of offices held, which supports the "carry-over" hypothesis. When work does not offer supportunities to develop and maintain skills, the incidence of non-work activity requiring those skills decreases. More social interaction in voluntary organizations other than church, suggesting that social skills maintained at work help seet the demands of voluntary organizational activity. This result also suggests that the "compensatory" hypothesis that workers compensate for the technical constraints and social isolation of the job in their spars time should be rejected.

Melton, A. W. & Briggs, G. E. Engineering psychology. Annual Review of Psychology, 1960, 11, 71-98.

Review of research literature emphasizing the identification of human performance function relevant to design of man-machine systems and work environments for the Human operator. Topics include man on space, stress, information display, control variables, feedback variables, skilled performance, monitoring and vigilance, decision making, and multiman-machine systems.

Merrens, M.R., & Garrett, J.B. The Protestant Ethic scale as a predictor of repetitive work performance. <u>Journal of Applied Psychology</u>, 1975, 60, 125-217.

The Protestant Ethic Scale was administered as part of a large test battery to 333 introductory psychology students. Forty mals and female subjects, of whom 20 had scored at least one standard deviation above the mean score on the Protestant Ethic Scale (high-protestant ethic group) and 20 had scored at least one standard deviation below that man (low Protestant ethic group), were selected to participate in a repetitive task (writing X's on sheets of paper). The high Protestant ethic group spent significantly more time working on the task (p(.01) and produced significantly more output (p(.001). It was concluded that the type of work behavior studied is a component of the Protestant ethic personality variable.

Mense, L.A., Aronoff, J., & Wilson, J.P. Motivation as a mediator of the mechanisms underlying role assignments in small groups Journal of Personality and Social Psychology, 1972, 24, 14-90.

Examined the hypothesis that motivation mediates the influence of external status and personal attributes on leader-follower role differentiation. Twenty-four triads were formed, each composed of one male and two females (undergraduate students) who were homogeneously high on either safety or esteem needs. The groups' task-criented activity in a standard situation was coded using Borgata's Interaction Process Scores. As predicted, (a) males became leaders more often in safety groups than in esteem groups, and (b) the correlation between leadership and suagests solution scores, a manifestation of task competence, was significantly higher for esteem groups than safety groups. In addition, seating position of the male tended to interact with motivation. Findings were used the argue that a complex model is necessary to describe the development of role differentiation in small groups.

Migliore, R.H. Improving worker productivity through communicating knowledge of work results. Management of Personnel Quarterly, 1970, 2, 26-32.

Sejorts on two studies conducted in a midwest mass-production manufacturing plant. Study I involved 60 employees in
a press department and was conducted in three stages: Control
period, preliminary stage and full scale implementation. Knowledge of results in Study I utilized five different methods of
communication of results which included posting of daily charts,
meetings, and informal contact by the supervisor with individual
morkers. Besults of Study I indicated significant improvements
in productivity on all quantitative measures and a reduction in
variability of the performance index. Knowledge of results had
favorable effect on performance of both experienced and inexperlenced workers: Study II involved is supervisors and 400 workers
in two departments, press and assembly. Knowledge of results
involved only one method of daily posting of the production reports. The second study did not provide evidence of a high degree of improvement in performance but the author reports that
the results were in the hypothesized direction.

Report does not contain complete statistical data and study failed to control for other variables. Knowledge of results was contaminated with an employee recreation program.

Miller, E.J., & Rice, A.K. Systems of organization: The control of task and sentient boundaries. London: Tevistock Publications, 1967.

Represents a new stage in the development of the work of the Tavistock Institute of Human Relations in the field of organization theory. Earlier work, particularly in coal-mining and the Indian textife industry, had suggested that forms of work organization could be developed which simultaneously met the technical requirements of the task and satisfied important human needs-particularly the need to belong to a primary task group with a meaningful set of objectives. This work led to the emergence of the concept of 'joint optimisation' as a strategy in organization design—the strategy of choosing a form of task organization which jointly optimises the technical and social sub-systems of the enterprise.

In the book this theoretical position has been modified in important respects, as the research activities of the Institute have spread from manufacturing into other task fields such as selling and service activities.

Miller and Rice argue that the type of organization in which task groups share common boundaries with the groups with which people readily identify themselves is a special case. They put forward the general proposition that enterprises require three forms of organization—one to control task performance, a second to bring about commitment to the organization on the part of its mombers, and a third to regulate relations between task and social systems.

They also argue that the theory of organization which had boon developed on the basis of studying production systems failed to recognize the significance of transactions taking place across the boundaries between sub-systems. Their second general proposition is, therefore, that boundary regulation is the 'essential managerial Control in any enterprise, industrial or non industrial

Both propositions are explored in the context of case studies of a sales force, a dry-cleaning service, a family business, a major construction project, a research laboratory and an airline.

Miller, L.K., & Hamblin, R.L. Interdependence, differential revarding and productivity. <u>American Sociological Review</u>, 1963, 10, 768-778.

Previous work on the effects of cooperative and competitive settings appears to be completely ambiguous. An examination of these studies suggests that the strength and direction of the effect is strongly influenced by the extent to which the group has an interdependence task. A review of the literature suggests that the results may be generalized to a variety of types of groups. The thesis is put forward that these results may be conceptualized in terms of a balance between two opposing behavior patterns: one oriented to greater individual productivity and one oriented to blocking the productivity of others. This paper reports an experiment confirming the hypothesis (N=60 male students) participating in a puzzle type solution problem under differential reward systems.

Miller, R. B. Task taxonomy: Science or technology. Ergonomics. 1967, 10 (2), 167-176.

Review of task taxonomy and presentation of a taxonomy of human performance. Taxonomy includes following categories: concept of purpose, scanning, identification of relevant cues function, interpretation of cues, short term memory, long term memory, decision making, and problem solving and effector response.

A classification matrix or grid is proposed consisting of three dimensions: (1) psychologically functional categories (e.g., atrategy, memory), (2) categories of task content, and (3) successive stages of learning.

Mirels, B.L., & Garrett, J.B. The Protestant Phic as a personality battery. <u>Journal of Consulting and Clinical Psychology</u>, 1971, 26, 40-44.

In an effort to explore the psychological meaning of the Protestant Ethic, a scale comprised of items selected on the basis of a series of factor analyses was administered togother with a battery of personality measures to a sample of 117 male undergraduates. Scores on the Protestant Ethic Scale were positively related to the Mosher scales for Sex Guilt and Morality Conscience Guilt but were unrelated to the Nostile Guilt Scale. Scores were also positively associated with authoritarianism and with expectancy for internal control. In a second study with 54 male and 55 female undergraduates, Protestant Ethic Scale scores were positively correlated with Strong Vocational Interest Blank scales for occupations demanding a concrete, pragmatic approach to work, and negatively correlated with scales for occupations which typically require emotional sensitivity, theoretical interests, and humanistic values. Suggestions for future research were noted.

Miskel, C. Intrinsic, extrinsic, and risk propensity factors in the work attitudes of teachers, educational administrators, and business mangers. Journal of Applied Psychology, 1974, 59 339-343.

Parallel versions of Borgatta, Ford, and Bohrnstedt's Work Components Study Questionnaire were used to compare the job orientations of college-educated employers in educational and business organizations. The sample was composed of 432 teachers, 118 educational administrators, and 192 business managers. Multiple and simple classification analysis of variance procedures were used to explore relationships and group differences across the attitudinal sub-scales. The hypothesis that the attitudes of educators differ from the attitudes of business managers toward intrinsic-extrinsic rewards and risk orientations was supported. Finally, a continuum of differing group profiles was proposed. The business managers evidence attitudes with high-risk propensity and lens concern for extrinsic factors. At the opposite pole, the teachers show low-risk proponsity with a high concern for extrinsic factors. The two educational administrator groups, appearing in the middle of the continuum, are similar in their attitudes to teachers in having a high concern for extrinsic factors and security, but when risk is attached to intrinsic factors, they resemble the business managers.

THE RESIDENCE OF THE PARTY OF T

Mitchell, T.R., '& Albright, D. Expectancy theory predictions of Maval aviation officers' job satisfaction, job effort, job performance and retention. Technical Report No. 71-17, May 1971, University of Washington, Contract Nonr N00014-67-A-0103-0013, Advanced Research Projects Agency, U.S. Navy.

Used expectancy theory to predict effort, satisfaction, performance and retention of two squadrons of Naval aviation officers. Ss (51 Naval aviation officers) comploted an officer attitude questionnaire (OAO), which obtained data on personal information, reenlictment plans, and key variables of the theoretical model of work softwation. Commanding officers rated each subjects' effort and performance on a 7 point CO/XO rating form. The results supported three hypotheses derived from expectancy theory.

- (1) The degree to which an individual is satisfied with his position and the Navy is a monotonically increasing function of the importance or attraction of various extrinsic and intrinsic rewards and the perceived instrumentality of his position for the attain-
- (2) The degree to which an individual is satisfied with his position and the Navy is related more to intrinsic satisfaction than extrinsic satisfaction.
- (3) The higher the amount of intrinsic satisfaction, the higher will be the expectation of remaining in the Navy. The cor-relation between satisfaction and retention was re.65. It was also found that the choice about staying in the Navy depends more on satisfaction with present position than with satisfaction for the Mavy in general.

Hohr, L. B. Organizational technology and organizational etructure. Administrative Science Quarterly, 1971, 16, 444-459.

Investigated the relationship of organizational structure and technology. Data analysis was based on 144 work groups fr 13 health departments selected randomly. Work groups included custodians, nurses, dog catchers and physicians.

(5)

Contrary to impressions that might be obtained from the literature on technology and structure, there is not a great deal of reliable evidence that the social structure of organizations is strongly affected by technology. The present research finds a very weak relationship between technological manageability and subordinate participation in decision making. When the conceptualization of technology is expanded to include more than manageability, a moderate relationship with participativeness emerges. No support is found for the hypothesis that the effectiveness of an organization is determined by the consonance between its technology and its social structure. Technology and structure are both multidimensional concepts that cannot be expected to be related in a simple manner. Future research on the determinants of most dimensions of social structure in organizations should probably emphasize independent variables other than technological characteristics.

The effects of knowledge of results (KR) and monetary reward on six hours of uninterrupted monitoring of a complex visual display were examined. Comparisons were made among groups receiving: no KR about response adequacy, KR, KR plus monetary reward or penalty determined by response adequacy, and KR plus reward in practice but not during the criterion session. In addition, comparison was made between the no-KR group and a similar one run by Mebber and Adams (1954) where a rest had been given after three of six hours monitoring. All groups showed performance decrements of small magnitude. The manipulation of KR and reward failed to deter decrement. Poward in addition to KR did enhance overall performance, however, KR alone did not facilitate performance, contrary to results from other studies. Training under KR plus reward did not enhance criterion performance when no KR or reward was provided. In support of previous researce man's monitoring capabilities over extended time periods seem adequats for modern systems.

Morris, C.G. Task effects on group interaction. Journal of Personality and Social Psychology, 1966, 4, 545-554.

A mystematic investigation of the effects on group interaction of 2 task characteristics: task type (production, discussion, problem solving), and level of difficulty (high, medium, low). Evidence was also gathered on the effects of ordinal position. Analysis of transcripts from 108 3-man groups indicated that task type significantly affected the distribution of more than 60% of the group activity, with production (creativity) and discussion tasks being least alike. Task difficulty had less effect on group activity. Significant changes were found in group activity from the 1st to the 4th sessions. The data were interpreted in terms of methodological implications for small-group research, and several research strategies were proposed to minimise these methodological problems.

Morse, J.J. A contingency look at job design. California Ranagement Review, 1973, 16, 67-75.

Theoretical article on research program at five organizational medical article on research program at five organizations units () pairs of research laboratories and 2 pairs of manufacturing and assembly plants) to measure the interactions and interdependencies among task and technological variables, individual personality characteristics, organization and job design attributes, the level of organizational effectiveness and the level of individual motivation.

The following variables have been found to be important: (1) degree of certainty of tasks and goals including performance feedback, (2) individual attitudes toward authority, the group tolerance for ambiguity and cognitive complexity and, (3) motivation to feel competent in mastering the job.

Only when all three imputs (a job design, individual predis-positions and technological variables) are contingent on and fit each other systematically is there likely to be high employee motivation and high task performance. The better the fit the higher the motivation and performance,

Morse, J. J. Person-job congruence and individual adjustment and development. Human Relations, 1975, 28, 841-861.

This research was conducted at the clerical and hourly employee levels in two large organizations. It investigates the congruence or "fit" of five personality predispositions with the relative certainty of jobs. The hypothesis tested is that this person-job congruence is related to individual psychological adjustment and development at work, as represented by an individual's 'sense of competence' on the job.

These findings lend support to the research hypothesis that person'job congruence will be associated with, first, greater adjustment and, second, more growth and development at work, at clerical and hourly levels in an organization.

Individuals working on routine, predictable jobs can be just as adjusted and can experience just as much grewth and development at work as people working on uncertain, unpredictable, complex jobs. Person-job congruence based on participants' ratings of the job agreed well with the congruence based on supervisory ratings. In the control group, though, there was a discrepancy between participants' and supervisory ratings of job certainty significant at .05. The discrepancy in general tended to lead to higher person-job congruence based on personal job ratings than on supervisory ratings. It is as if people in the control group were seeking higher congruence by percoiving jobs in line with their personality tendencies.

The findings seem to have special implications in two areas These are: (1) integrating recruitment, selection and placement processes in the organization with the design of jobs to provide for individual adjustment and development at work through person-job congruence; and, (2) the broader and more complex issue of understanding man at work.

In this research, the dynamic which seemed to be leading to an individual's adjustment and development through a some of competence was congruence of person and job, and not any universal, normative ideas about how all people ought to prefer to behave or how all jobs ought to be designed. The findings here advocate thinking that an individual, whether he is working on uncertain, ambiguous, complex jobs providing much worker autonomy or working on ocertain and routine jobs providing much worker autonomy or working on certain and routing has not providing much worker autonomy, can grow and develop at work through an evolving and increased sense of competence. The feeling of competence is not reversed only for the individual experiencing complexity, uncertainty and autonomy on the job. A person's most cherished accomplishment is his own competence in mastering his own intellectual and physical environment.

Norse, M. C. and Reimer, E. The experimental change of a major organizational variable. <u>Journal of Abnormal and Social Psychology</u>, 1966, 52, 120-129.

A field experiment in an industrial setting was conducted in order to test hypotheses concerning the relationship between the means by which organizational decisions are made and (a) individual satisfaction, and (b) productivity.

Using four parallel divisions of the clerical operations of an organization, two programs of changes were introduced. One program, the Autonomy program involving two of the divisions, was designed to increase the role of the rank-and-file employees in the decision-making processes of the organization. The other two divisions preceived a program designed to increase the role of upper management in the decision-making processes (the Hierarchically-controlled program). The phases of the experiment included: (a) before measurement, (b) training programs (or supervisory personnel lasting approximately 6 months, (c) an operations period of a year for the two experimental programs, and (d) after measurement. In addition, certain measurements were taken during the training and operational phases of the experimental "take" and on the general hypotheses on individual satisfactions and productivity. Briefly, it was found that:

- The experimental programs produced changes in decision making allocations in the direction required for the testing of
- the hypotheses.

  2. The individual satisfactions of the members of the work groups increased significantly in the Autonomous program and decreased significantly in the Hierarchically-controlled program.

  3. Using one measure of productivity, both decision-making systems increased productivity, with the Hierarchically-controlled program resulting in a greater increase.

The relationship of the findings to the so-called "Hawthorne effect" is examined and the experimental programs and their results are considered in the light of a theoretical description of the role of the control and regulation processes of large organizations.

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Moses, J.L. Selecting vigilant types: Predicting vigilance per-formance by means of a field dependence test. Experimental Publi-cation System, 1970, Issue No. 4, Ma.No. 1518.

Investigated effects of perceptual style on vigilance display tasks differing in complexity. Ss were 122 male undergraduates who completed Embedded Figures Tests. Theony field dependent and field independent subjects were selected to monitor vigilance displays. One display was a simple vigilance task (one bulb), the other task was complex (4x4 matrix of bulbs). Ss monitored each of the displays for 45 minute periods.

Results indicated that there were no differences in the per-formance of either group on the simple task. On this task field dopendont Ss had higher initial performance. On the complex task, field independent Ss were superior monitors. Field independent Ss also exhibited less performance decrement.

Munsinger, H., 4 Kessen, M. Uncertainty, structure and preference. Psychological Magagraphs, 1964, 78. (Whole No. 586).

617 adults and children served as 5s in 9 studies of the relation between expressed preference and differing amounts of variability of stimulation. Random shapes and different sequential approximations to English were used as variations in stimulus variability. The results supported the following generalizations: Human beings are sensitive to the amount of variability in stimulation. There is an intermediate amount of variability which was consistently most preferred by unsophisticated 5s. Preference for the stimuli used was jointly determined by number of independent characteristics of the stimuli and their meaningfulness. Proference for variability changed with 5s' experience with variable stimulation, whether the experience was induced experimentally or was the result of specific professional training. The tendency to increase preference for stimulation of high variability is related to 5s' ability to code or process variability. 617 adults and children served as Ss in 9 studies of the rel

Murrell H. Blood sugar level and performance. Occupational Psychology, 1971, 45, 273-280.

The suggestion that rate of production would be related to the blood sugar level of the operative was examined. Subjects involved two women age 53 and 39, who worked on a lab simulation of testing electrical age 51 and 39, who worked on a lab simulation of testing electrical components. In the first experiment production improved, both when a glucose drink and a placebo were given, even though the blood sugar level increased only when the glucose drink was given. There was no significant difference between results in the two conditions. A second experiment compared giving a glucose drink to giving no drink at all Subjects were four women age 18 and 19. Performance improved only when the drink was given and there was a significant difference between cerformances under the two conditions. The results seem to indicate that performance is not related so such to the ingestion of glucose with the consequent increase in blood sugar level, as to the fact that a drink was given at all.

From these small experiments it can be concluded that the rate of work or production is not necessarily related to blood sugar level, and that the effect of drink taken during work may be related to things other than the actual content of the drink, for example subjects' expectations of its effect. A probable indication is that if, through advertising or other means, people believe that a particular drink will improve their performance and it will probably do so.

Murrell, K. F. W. Performance differences in continuous tasks. Acta Psychologica, 1967, 17, 427-435.

In continuous and/or repetitive work there are performance differences both between individuals and within individuals which cannot be related to any experimental variable. Tasks to which this applies may be active or inactive and it is argued that those tasks lie at two ends of a continuum, so that causes of changes in performance may be common to both. It is suggested that these causes of changes in performances may be due to changes in arousal and that these, in turn, may result from a subject becoming voluntarily auto-aroused. A sechanism for auto-arousal is proposed as also is one for the decline in arousal with time. This proposition can normally be tested only by behavioral means and an experiment is reported during which changes in the conditions are made which might be thought to change the arousal levels. These include the administration of alcohol and caffeing, isolating the subject, and administration of sloohol and caffeing, isolating the subject task (N = 5 subjects working on 3\hat hour shifts for 10 weeks). Preliminary examination of the results of these experiments suggests that the subjects can themselves manipulate their arousal levels, independent of the experimental variables imposed by the levels, independent of the experimental variables imposed by the

Murrell, K.F.H. Laboratory studies of repetitive work: IV Auto-arousal as a determinant of performance in monotonous tasks. Acta Psychologica, 1969, 29, 268-278.

Study involved twenty-one subjects who worked on a simulated industrial task of inspection of electrical components. Subjects worked for four hours a day under varying conditions. The authors reverw three vigilance hypotheses. (1) strategical-expectancy and statistical approaches (2) Behavioral inhibition (3) Neurological activation or arousal. Authors conclude that conclude that

- (1) Auto-arousal is probable and may be compared with "self-arousal" or with "wakefulness of choice".
- (2) That hyper-arousal is improbable as a cause of appearance of irregularity.

(Section Assets)

(3) The offects which have been studied are too complex to describe by a single non-specific level of arousal.

Auto-arousal can produce phasic as well as tonic arousal with the phasic arousal directed towards a particular objective. A phasic change may produce a shift in tonic level. It is well established that there are "damping down", corticofugal projections to the reticular formation which must increase as auto-stougal increases if homeostasis is to be maintained. It is suggested that it is these downward crejections and not hyper-arousal which cause the irregularity 'psychological "fatigue"?) and/or deterioration of performance. As the damping down increases, it will override other effects 'if it did not, the organism would "blow-up") and will continue until there is some change in status such as a break in the continuity of the task, or until a balance is reached when arousing effects can again credeminate. In other words, some of the behavioural effects which have been described may be related to what may be called anti-arousal.

When all this has been said, we must remember that a subject may manipulate her arousal as she wishes, and not as is wished by the ex-

Myers, M.S. Who are your motivated workers? Harvard Business Review, 1964, 42, 73-88.

Reports on interview study of 282 employees (231 males and 51 females) at Texas Instrument in 1961. Employeers were randomly selected from three salaried job categories (scientist, engineer and manufacturing supervisor) and two hourly classifications (technicians and assemblers). Interviews centered on descriptions of favorable and unfavorable situations at work.

A total of 715 sequences were obtained from the 282 interviews. Of this total 54% of the sequences were favorable and 59% involved long range work situations. Elements of the sequences were divided into first level factors which are the actual events or circumstances leading to favorable or unfavorable feelings and second level factors which were the explanations why the event caused favorable or unfavorable feelings. Fourteen first level factors were identified with achievement as the largest category accounting for 31% of the sequences. Company policy and administration accounted for 14% of the sequences, most of them unfavorable. Twelve second level factors were identified (many the same as first level factors).

Study concludes that factors in work situation which motivate employees are different from factors that dismatisfy omployees. Notivation stems from the challenge of the job through such factors as achievement, responsibility, growth, advancement work itself and earned recognition. Dismatisfactions more often spring from factors peripheral to the task (maintenance needs).

Myors, M.S. Conditions for manager motivation. Harvard Business Review, 1966, 44, 58-69.

Study based on data obtained from 1,344 managers in Dallas division of Texas Instrument (upper managers N=91, middle managers N=683, lower managers N=570). Attitude data was factor analyzed and identified eight factors: (1) motivation on jeb (2) supervisory style of boss (3) work after hours (4) attitude toward status symbols (5) assumptions about people (6) recreating and community activities (7) freedom of action and (8) job

- Motivation of managers is dependent on interpersonal com-petence, the opportunity to work toward meaningful goals and existence of appropriate management systems. Other findings: (1) motivation highest among top management. (2) motivation related to supervisory style of immediate boss: developmental supervisors stimulate motivation; reductive supervisors inhibit motivation. (3) all managers prefer developmental supervisor regardless of their own style. (4) motivation for the manager is both a consequence and symptom of affective job performance.
- Myers, M.S. Every employee a manager: More meaningful work through job enrichment. New York: McGraw-Hill, 1970.

Reports on Texas Instrument's implementation of a program in which every employee is involved in the organization to an optimum extent. Strategy was to transform hourly subordinates into managers over their own job by a process of job enrichment. The basic assumption of the approach is that "creative" involvement of people from all levels of the organization in the tasks of setting meaningful goals through a process controlled by competence rather than authority will produce an effective human system characterized by interpersonal competence and goals that satisfy the needs of the organization and its participants.

Every employee assumes responsibility for processing, plan-ning and controlling. Supervisors assume role as advisers, con-sultant and coordinators.

Myers, M. S. Overcoming union opposition to job enrichment. Harvard Business Review, 1971, 49, 37-49.

Discusses problem that organizational development (OD) efforts are often impeded by labor unions—particularly when the efforts infringe on what unions see as their perceptive of prescribing the roles and reward systems of the workers. Unilateral pursuit of OD efforts by management usually intensifies its win-lose relationship with the union. Noth company and union must become involved in the change process, with management taking the first step. This article describes four company approaches to making job enrichment and other aspects of OD feasible in the unionized work force.

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These models are not techniques of manipulation or exploitation, but processes that simultaneously serve the needs of the organization and its members. The models differ in origin:

The confrontation model is illustrated by a process developed in a major food chain in Canada. It is patterned after Robert R. Blake's "Phase 1" confrontation following preconditioning by members of management and leaders of local unions.

The management training model evolved from a management.

The management training model evolved from a management seminar approach developed in a major wood products company in the United States. This model is initiated by having both corpany managers and local union leaders learn together in management seminars and workshops

meminars and workshops.

The reorientation model is a serendipitous consequence of efforts in a major chemical company in Canada to apply behavioral science principles in the opening of a new plant in the suburbs of Toronto

The <u>negotiated collaboration</u> model, as described by Richard Bockhard, illustrates the consequences of cooperation between management and international labor unions in Europe in furthering organization effectiveness through job enrichment.

Nathanson, C. A., & Becker, M. H. Job satisfaction and job per-formance: An empirical test of some theoretical propositions. Organizational Behavior 6 Human Performance, 1973, 9, 267-279.

Derived 3 hypotheses specifying conditions for finding a relationship between job satisfaction and performance using Locke's conceptual analysis. Data were tested from a study of 103 physicians providing routine pediatric care in ambulatory clinics. Satisfaction and performance were positively associated when (a) the physician's intrinsic job values supported patient care activaties, (b) the physician received professional recognition from outpatient care, and (c) commitment to outpatient care arose from interest in the activity itself rather than from its value as a means to long-range career goals. These findings support the hypotheses based on Locke's work. It is suggested that certain conditions particular to the settings in which this research was carried out may have contributed to these resoults.

and team performance. Journal of Applied Psychology, 1969, 52, 167-177. Naylor, J.C., & Dickinson, T.L. Task structure, work structure

Examined factorially three different work structures with Examined factorially three different work structures with two levels of task structure and two levels of task organization using two-men teams (subjects = 200 female students) in a multiple cue inference task in an initial tost of the Dickinson-Nayler taxonemy of team performance. All teams performed for 200 trials. Task structure significantly influenced team achievement, consistency, and matching (more atructured task higher achievement consistency and matching) while task organization influenced only team achievement and matching behavior (high task organization decrement in team achievement and matching). Work structure failed to show any effect upon performance except in terms of the degree to which team responses could be predicted from individual member responses.

Neeb, R.W., Cunningham, J.W., & Pass, J.J. Human attribute requirements of work elements: Further development of the oc-cupation analysis inventory. JSAS Catalog of Selected Documents In Psychology, 1974, 4, 145.

An attempt is made to link a set of work elements describing different kinds of work, activities and conditions with selected human attributes in the cognitive, affective, and psychomotor docains. The purpose of the study was threefold: (a) to derive attribute-requirement estimates for the 622 work elements contained in the Occupation Analysis inventory (OAI), (b) to derive basic work dimensions (factors) from the attribute-requirement profiles of the GAI work elements, and (c) to determine the stability of the resulting work dimensions. The first phase of the study involved the development of an Attribute Requirement Inventory (ARI) containing definitions of 100 human attributes for which there are identifiable tests. Judges rated the Thegree of Relevance of each ARI attribute to each of the work elements (items) in the OAI. Attribute-requirement estimates were computed for the OAI elements by averaging judges' ratings for each work elements on each of the attributes. An analysis of interrater agreement indicated substantial reliabilities for the attribute-requirement estimates. Next, the work elements within six separate sections of the GAI were intercorrelated based on their attribute-requirement estimates. Next, the work elements within six separate sections of the GAI were intercorrelated based on their attribute-requirement estimates. Next, the work elements within six separate sections of the GAI were intercorrelated based on their attribute-requirement estimates. The six analyses yielded 77 interpretable factors. The rating data were then divided into two samples, and six factor analyses were performed on each sample. Evidence of factorial stability was obtained through comparisons across the two samples using Tucker's coefficient of congruence and the Pearson product-moment correlation. Finally, the 77 first-order factors were subjected to a higher-order factor analyses.

Neeley, J.D. A test of the need gratification theory of job satis-faction. Journal of Applied Psychology, 1973, 57, 86-88.

Tested two hypotheses of Wolf's need gratification theory Tested two hypotheses of Molf's need gratification theory of job satisfaction-dissatisfaction, which emphasizes the moderating influence of psychological needs on the relationship between job elements and satisfaction. The needs of a stratified random sample of 75 noncademic college employees were assessed by projective methods (e.g., the TAT). It was concluded that differences in psychological needs were not associated with differences in the kind of job elements that were matinfying/dimentiafying.

The failure of need gratification theory to be supported by The failure of need gratification theory to be supported by this research suggests a deficiency in the formulation of that theory. Studies investigating the influence of personality variables alone are not as likely to increase our understanding as are studies which examine the simultaneous effects of both personality and situation variables on job satisfaction. This criticism may also apply to need gratification theory which in its present form contains no provision for situation differences and their potential interaction with psychological needs. Perhaps this is a direction in which need gratification theory could be profitably developed.

Beveweek. Motivating people: Money isn't everything. Newsweek, April 22, 1968, 80-82.

Report of job enrichment programs at Texas Instrument and ATST. Includes discussion of Herzberg's theory of motivation and Likert's participative management approach.

The job blahs: Who wants to work? Newsweek, March 26, Newsweek T 1973, 79-89.

Reports on the alienation of workers in America. "They are bored, frustrated, rebollious; sometimes they're drunk on the job or spaced out on druga." Interview's with four American workers are included. Job enrichment programs at General Foods, General Motors, Indiana Bell, Kaiser Steel, Monsanto, Travelers Insurance, and Corning Glass are briefly reviewed. A contrasting report on the Japanese yen for work is included.

Borcross, D. Open to discussion: How to make work more enjoyable. Parade Magazine, June 30, 1974, 21-22. (a)

Journalistic-report of Task Force Report on work in America, and attempts by industry to give more responsibility to workers. Reports on projects at Kaiser Steal, General Foods - Topeka Kansas Plant, Plywood Companies Northwest, Scott Bader Co., Renault Auto Plant - France, Volvo Plant - Sweden.

Calls movement "job democracy" and notes that union opposition to job enrichment involves labeling job exrichment as a management trick to prevent unionization and raise productivity and profits with no payoff to workers.

Norcross, D. Sweden's newest export - industrial democracy. Parade Magazine, December 15, 1974, 15. (b)

This article explores the concept of industrial democracy which advocates a program in which workers join with management in improving the quality of the work environment and productivity. This program has been initiated in Sweden in companies with more than 100 employees by requiring them to place two representatives elected by the workers on their board of directors. Other innovations include redesioning assembly lines to alleviate monotony, job rotation, and an increase in work teams to increase productivity and decrease alienation. Essentially, the objective of the industrial democracy approach is to humanize the workplace through a joint, cooperative, and constructive effort by management and labor.

Worthrup, B. Morking happier: More Swedish firms attempt to en production-line jobs. Mall Street Journal, Oct. 25, 1974, 1-21.

Reports on job enrichment project at Kockum's shipyard in Sweden, Volvo suto plant. Ases a manufacturer of electrical equipment, a paper mill, a die casting shop, a glassworks and a rock drilling machine assembly department.

Notz, W.W. Work motivation and the negative effects of extrinsic rewards: A review with implications for theory and practice. American Psychologist, 1975, Sept., 884-891

Review of research literature on intrinsic and extrinsic motivation arrives at following conclusions:

- Under certain conditions, intrinsic and extrinsic motivation are non-additive (arousal of extrinsic motivation may occur at expense of intrinsic moti-
- The interaction effect may be symmetrical (the with-drawal of an extrinsic reward may enhance intrinsic motivation).
- Contingency of reward, expectation of reward, punishment and verbal reinforcement are all relevant variables.
- A great deal of conceptual confusion still surrounds the notion of intrinsic motivation and its relation-ship to both higher order need satisfaction and

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Odiorne, G.S. Where job enrichment and MBO meet. <u>Management</u> <u>Quarterly</u>, 1975, 6, 2-5.

Discusses 6 areas of congruence between job enrichment and MMO: 1) both concerned with individual differences, development, production as opposed to group differences, etc.; 2) each requires job design change: 3) each assumes central importance of work in life of ran: 4) each has affirmative assumption about nature of man and is success oriented rather than failure-prevention centered; 5) each has some contemporary features in its underlying theory (i.e. achievement centered): 6) each centers on a job itself as site for success, achievement, and recognition.

Purther points out that MBO can provide both hygiene and motivating factors.

Oldham, G.R., Hackman, J.R., & Pearce, J.L. Conditions under which employees respond positively to enriched work. Technical Report 4, September 1975. Yale University, Contract Nonr NO0014-75C-0269, Office of Naval Research.

This research tests the modurating effects of (a) employee growth need strength and (b) level of satisfaction with the work context on employee responses to enriched work. Data were collected from 201 employees who work on 25 jobs in a bank. Results show that employees who have strong growth needs and also are satisfied with the work context (i.e., with their pay, job security, co-workers and supervisors) respond more positively to enriched jobs than do employees who have weak needs for growth and/or who are dissatisfied with the work context. Implications for the practice of work redesign are discussed.

Oltman, P.K., Goodenough, D.R., Witkin, H.A., Freedman, N., Friedman, F. Psychological differentiation as a factor in conflict resolution. <u>Journal of Personality and Social Psychology</u>, 1975, 12, 730-736.

Previous studies have shown that persons matched in level of differentiation are likely to develop greater interpersonal attraction in the course of an interaction than are mismatched persons. These studies were all conducted in situations where the interacting persons were working toward a common goal. To test the hypothesis that situational variables may moderate match-mismatch effects, the present study inventigated them effects when the interacting persons were in conflict. Based on their performance in tests of field dependence-independence, subjects (forty college females) were selected as relatively high or relatively low in level of differentiation. Three kinds of dyads were composed, high-differentiation, in they high differentiation/low-differentiation, and their task was to recondile conflict on an issue about which they were known to disagree. It was predicted that begaues of the more accommodating quality of low-differentiation persons, dyads including one or two such subjects would more often reconcile their disagreements and show greater interpersonal attraction than would dyads consisting of two high-differentiation subjects. Both predictions were confirmed, supporting the hypothesis that the outcome of match or sismatch is mediated by situational variables.

O'Reilly, A. P. Perception of abilities as a determinant of performance. Journal of Applied Psychology, 1973, 5, 281-282.

Studied the relationship between performance effectiveness and perceived possession of required abilities awang 64 clerical workers in a public organization. The hypothesis that high performers perceive themselves as having more or higher levels of job-required abilities than do poor performers was supported.

O'Peilly, C.A., III, & Poberts, F.H. Individual differences in personality, position in the organization, and job satisfaction, Organizational Schavior and Human Performance, 1975, 14, 144-150.

Recent research has demonstrated that affective responses to work are related more directly to the structural characteristics of the organization than to individual differences. Individual characteristics, however, have often been thought to be antecedent to job satisfaction, but relevant empirical evidence supporting this notion has not been accumulated. The renearch reported here examines the relationships among 13 individual traits, 3 structural characteristics of the position, and 5 sepects of job satisfaction (Ne-587 navai enlisted men and officers). Partial correlations were first used to control for the effects of the structural characteristics, and canonical correlations computed to assess relationships among personality variables and job satisfaction. No significant relationships were found. Canonical correlations between structural characteristics and job satisfaction with personality traits partialled out were significant. These results were validated by randomly splitting the sample and recomputing the analyses. The general hypothesis that individual work-related traits affect job satisfaction was supported only insofar as intrinsic traits may predict attainment of position. Structural characteristics appear to be more directly linked to job attitudes than personality traits. Attitudes toward work environment are determined by organizations than the person. Models proposing direct links between individual differences and satisfaction do not seem varranted.

Organizational Dynamics. Job redesign on the assembly line.

Parevell to blue-collar blues. Organizational Dynamics, 1973,
2, 51-65.

Description, evaluation and comparison of job redesign projects at three European companies: Phillips N.V.-Netherlands, Saab-Scania-Sweden, Volvo-Sweden. Concludes that:

- None of three companies has lost economically by the change over from machine paced to man-paced assembly line. How much they have gained is an iffy question.
- (2) Individual reaction to job enrichment is difficult to forecast in terms of attitudes and performance. One thing is clear. Assuming job level is held constant, education is inversely related to satisfaction.
- (3) Job redesign results indicate that the only certifiable gain in productivity occured at N.V. Phillips. Quality turnover and attendance improved at Volvo but there was no measureable impact on productivity.
- (4) There is no one single element in job redesign that seems to account for the biggest increase in employee satisfaction.
- (5) Results indicate that employee attitudes and job satisfaction are correlated much more clearly with factors such as absenteeism, turnover and quality than they are with productivity.
- (6) There is only anectodal evidence on the impact of job redesign on quality, output, absenteeism and turnover. Management has achieved at least an economic draw from its efforts at job redesign and a measure of insurance against a fretful future in which employee expectations will become difficult to fulfill.
- (7) In answer to the question if the European experiment can be applicated in similar assembly lines in the U.S., the answer is yes in new plants. However, in a 1970 report of the Ford Foundation, it was reported that none of the corporation executives interviewed really believed that assembly line tasks could be significantly restructured.

Osipow, S. H., and Scheid, A. B. The effect of manipulated success ratios on task preference. <u>Journal of Vocational Behavior</u>, 1971, 1, 91-98.

The hypothemis that success influences task preferences was tested by subjecting 230 college undergraduates to three different success-failure reinforcement schedules and observing subsequent preferences for the tasks concerned (nonsense syllables and secretric forms). Success ratios of 85-154, 70-304, and 50-504 in tasks dealing with unpreferred stimuli were used. Results supported the hypothesis: the probability of change in task preference was greatest under high success reinforcement ratio conditions.

Owen W.B., & Croll, P.R. Productivity enhancement efforts in the federal government: A report on survey results program report evaluation and implications for research. JSAS Catalog of Selected Documents in Psychology, 1975, 5, 296.

A summary of the activities of the Personnel Research and Development Center, U.S. Civil Service Commission, with regard to specific behavioral science applications to improve productivity in the federal government is presented. It deals specifically with a survey conducted in early 1974 to assess efforts in the federal government to improve productivity by enhancing the human resources of the agencies. From the survey responses, 574 specific instances of human resource enhancement programs such as job enrichment, flexitime, etc., in 187 federal agencies were identified. Analysis of the responses indicated that interest in productivity enhancement programs by federal agencies is substantial, yet behavioral science expertise has not often played a key role in evaluating such programs. Implications of the survey results and analyses for the Commission's plans to enhance productivity through the broader utilization of behavioral science expertise are discussed.

Pallone, N.J., Hurley, R.B., & Rickard, F.S. Emphases in job satisfaction research: 1968-1969. <u>Journal of Vocational Behavior</u>. 1971, <u>1</u>, 11-28.

This review of job satisfaction research is the 25th in a series. It surveys 113 studies reported in 1968-69 relating job satisfaction to some 52 variables or sets of variables as correlates, predictors, or consequences. Variables investigated are keyed to specific reports and representative studies reflecting continuing or emorging emphases in job satisfaction research of greatest potential interest to vocational counselors and researchers are summarized. Conclusions: (1) the Minnesota theory of work adjustment promises to provide theoretical constructs useful in understanding vecational behaviors; (2) insufficient evidence is reported to support "two factor" theory; (3) little evidence suggests that entering an occupation congruent with one's measured interests yields job satisfaction; (4) salary is reported in several studies to be an important component of satisfaction; (5) relatively few personality traits are reported to relate to job satisfaction.

Parke, E.L., & Tausky, C. The mythology of job enrichment: Selfactualization revisited. Personnel, 1975, 52, 12-21.

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Brief review of job enrichment projects at AT&T, Texas Instruments, Motorola, General Foods, Maytag, Corning Glass, Donnelly Mirrors and Polaroid. Concludes that to make enrichment successful it must be properly designed to include the control mechanisms of accountability for performance and material rewards for output that meets or exceeds clear cut standards. Job enrichment designs based on the employees assumed inner need to accept and master challenging tasks can only result in essentially utopian exercises.

Patchen, M. Participation, achievement and involvement on the 10b. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

Reports the results of a study conducted by the Survey Research Center, University of Michigan.

Five geographically separate units of the Tennessee Valley Authority were studied. These units had a wide range of different job settings and different occupations including engineers draftsmen, operators of automated equipment, craftamen like boilermakers and machinists, chemical laboratory analysts and clerks.

Questionnaire data was obtained from the employees to answer two main research questions: (1) under what conditions are people highly motivated for achievement on the job (2) when do people come to have a sense of identification with the work organization.

highly motivated for achievement on the job (2) when do people come to have a sense of identification with the work organization.

Motivation was studied in terms of Atkinson's achievement incentive. Findings were as follows: (1) jobs of moderate difficulty lead to stronger motivation and this was not accompanied by greater symptoms of stress (2) more control worker had over work methods the greater the job interests and fewer the absences (3) prospect of feedback on performance by itself contributes little to motivation unless other conditions allow for rewards for achievement (4) frequent time limits contribute a little to job motivation at the cost of reduced pride in work (5) more chance to learn on the job fewer symptoms of stress like depression fatigue nervousness (6) combination of above factors produce highest motivation when reward for achievement is high (7) stress was highest in difficult jobs with frequent time limits, low control over work methods and low feedback on performance (8) differences in need for achievement as measured by Achievement Risk Preference Scale has little impact on job motivation when the job situation is not conducive to achievement (9) those with stronger occupational identification showed greater job interest but more frequent absences (10) employee influence on work goals has little impact on motivation except where attainment of goal has significance as a personal achievement (11) chance to use abilities for achievement achievement (11) chance and low turnover are related to the existence of a cohesive mutually supportive work unit (13) Praise by supervisors was in general not greatly valued (14) good work as a means to promotion has little effect on job motivation (15) rewards for achievement were generally additive (16) worker participation in cooperative programs and decision making lead to greater acceptance of changes in work (17) work groups whose members feel a high degree of soli@arity with co-workers identify with management goal (18) opportunity to use abilitie

Paterson, T. T., & Willett, F. J. An anthropological experiment in a British colliery. Human Organization, 1951, 10, 19-25.

Report of experiment in English coal mine to reduce accidents involving 260 workers.

The men are aware, on a rational level, of their interdependence in the field of safety, and the experimenters believed it necessary to translate this awareness to the subconscious or unconscious regions of thought—they had to become habituated to thinking in this fashion. To achieve this, the stimulus had to be as continuous as possible during working hours. The awareness of interdependence, the team sense, was symbolized by color, in this case it was yellow.

Since the majority of accidents occur on the coal face, it was decided to be most liberal with the color there, and since the majority of face accidents was due to incorrect setting of steel roof supports by one shift for the security of the next shift, the coal face and the setting of stells were the obvious targets for overt action by the experimenters.

The preparatory work of conditioning the men to the color symbol consisted initially of outlining the scheme to the whole working group, telling them of the intention to paint the steel supports, and drawing from them their understanding that the main cause of accidents was too great an individualization. It was stressed that the color symbol had its positive aspect, in that yellow was not to indicate danger, but "I'm leaving this place secure for my neighbor," or "my neighbor left this secure for me."

Through constant contact with these men and by expanding and emphasizing to them the experimenters' ideas, any tendency to resist the color symbol stimulus was reduced.

Throughout the period of the experiment, every opportunity was taken to strengthen the cohesion of the section as a group, particularly in relation to the remainder of the pit.

On February 12, 1949, after four weeks of verbal stimulation, the 562 movable steel roof supports were painted with an 18" yellow hand. This initial painting had to be removed on March 6, because poor quality paint absorbed the coal dust and became obliterated. The second painting was allowed to deteriorate gradually and lasted for about three months. Verbal stimulation was continued at a high intensity throughout February. March and April and was then gradually reduced to a much lower degree throughout July, August and September until it was on the same level as the experimenters' interactions with other sections.

To establish by control the effect of color alone, similar painting has been carried out at another colliery in the area, the Frances, with which the experimenters were careful to have the minimu of contact. Since it was necessary to allow a sufficient time interv between the two faintings to prowent atmulation leaking from the vichael to the Frances, to avoid distorting effects of seasonal fluctuations in ascident rates, and because gnographical separation might have meant borking in a different social situation, it was decided to delay this control examinent until a year after the original. It is, therefore, still under way and is inconclusive as yet (May, 1950), though there does appear to be little effect due to color alone.

From the beginning of the verbal stimulation in January, 1949, the accident rate in the Top East Branxton fell until mid-March. On March 28, the section began to run into bad working conditions, the coal was "burnt" by proximity to a fault and an intrusion; that is, it became more brittle and thinner, and the average working height dropped to three feet.

During this first period, the face workers found that the bright color on the stend supports enabled them to line the supports up more easily in the desired straight lines, and there was a decrease in the number of improperly set steels. This overt reaction lasted for 14 days after the first painting and for 10 days after the second.

By comparison with the rate for the total pit, or for the Bottom sortion working in similar conditions, the reduction in accident rate during the period of the experiment was considerable, by 54 percent of the expected accident rate. The reduction was real and not the result of lessened reporting, for the number of wound dressings used by the firemen also decreased. Shifts lost through accident fell correspondingly.

It is believed that the results demonstrate the practicality of the method in reducing accident rate in coal mining, and test the validity of the premise of this report.

 Parallel experiments could be carried out to prevent or lessen the extreme individualization that appears to be a consequence of mechanization and may underlie much of the resistance to machinery in the mine. This is the background to the discrepancy between calculated and effective increase of production after mechanization.

Paul, W. J., & Robertson, K. B. Job enrichment and employee motivation. London: Gower Press Limited, 1970.

Reviews the experiments in job enrichment carried out at Imperial Chemical Industries in 1967 and 1968. After a brief resume of Horrherg's theory of motivation on which they are based, it describes the background and aims of the study and the experimental structure. There then follow six chapters, one for each of the studies which satisfied the experimental design, and two chapters on other related projects. Finally, the conclusions and comments on the study are presented as answers to the specific questions stated in the aims.

The changes made to jobs were designed to give "greater scope for personal achievement and recognition, more challenging and responsible work, and more opportunity for individual advancement". However, when the details of the changes are examined one is left with the impression that, although these aspects are certainly present, the most important common element in the changes is one of greater efficiency. Communication blocks are removed, top-heavy supervisory atructures are pruned, available skill and knowledge are utilised more efficiently all of which a compotent O.R. man or systems engineer might have suggested without the thought of motivation entering his head. An important part of the change among draughtsmen was to set up a project team-satisfying social needs which in any theory of motivation affect job satisfaction. Other shanges provide knowledge of results which has frequently been shown to affect productivity.

The authors made a laudable attempt to quantify and measure the effects of the changes, but because of the importance they place on this one must criticise them for the way in which they went about it in some of their studies. Many of the measures used to test the success of the experiment show that the subjects were able to bear their new responsibilities adequately, but little is said about whether they performed the unchanged parts of their jobs better, which is the real test of an increase in their motivation. As for the measures themselves, in two of the six studies, the only measure used is a sonior manager's assessment, and since these senior managers had been convinced of the need for job enrichment before the study started, and had been responsible for suggesting most of the changes which should take place, their judgement can hardly be regarded as unbiased.

One study involving 19,500 factory floor workers involved job rotation and small group input into the work process. It was reported that there was a 20% reduction in labor, 20% increase in production, 25% increase in pay and a 30% cut in supervision.

Paul, W.J., Robertson, K.B., & Herzberg, F. Job enrichment pays off. <u>Harvard Business Review</u>, 1969, 47, 61-78.

Reports on a number of job enrichment studies which were and are still being carried out in Imperial Chemical Industries Limited and other British companies. The purpose of the studies was an attempt to shed light on important job enrichment questions dealing with (1) the generality of the findings, (2) the feasibility of making changes, and (3) the consequences to be expected. In addition, the studies set out to determine how the concept of job enrichment may be most effectively applied in furthering the attainment of business objectives. Among them, they cover not only widely different business areas and company functions, but also many types and levels of jobs. Collectively, they provide insights which add to management understanding of both theory and practice.

The job enrichment projects are briefly deserted be at (1) Scientific laboratory technicians (experimental officers EO) technical, financial, and managerial tasks were added to EO's responsibilities (N-15). A control group of EO's jobs (N-29) were not changed. After 6 months, experimental group of EO's inproved significantly in areas of knowledge, comphrehension, synthesis, original thought, skill in report writing as measured by monthly progress of research work.

progress of research work.

(2) Sales representatives - Experimental group (N=15) job's ware cariched so that the job was more complete and self-contained. After a 9 month period, sales performance of the experimental group (N=21).

(3) Design engineers - jobs enriched by reducing supervision, adding responsibility of engineers, choosing own consultants, and authority to spend money on approved projects. Results indicated supervisors were free to give more time to technical development and engineers were able to function independently. There were no adverse budgetary effects or decision.

(4) Two studies - factory supervisors and foreman. Jobs enriched by involving workers in technical planning and consultation, and supervisors were given more authority to hire, discipline, and train employees. Results indicated fewer work stoppages, less disciplinary problems, and cost savings.

Pelisser, R.F. Successful experience with job design. <u>Personnel Administration</u>, 1965, 12-16.

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Reviews examples of job enlargement and job purification in three federal agencies (Internal kewenue, Bocial Security Administration, and Federal Communications Commission). Job purification involves reducing the number of functions in a professional job by using non-professional assistants. Concludes that both job enlargement and purification have resulted in increased job satisfaction, easier job recruitment and advancement of professional personnel. In the future these federal enlargement projects may result in better service to the public. No statistical data supplied to support conclusions.

Pennings, J.M. Work value systems of white-collar workers. Administrative Science Quarterly, 1970, <u>15</u>, 397-405.

Study of large electronic manufacturing organization in the Netherlands. Random samples of low white-collar workers were interviewed (Total N = 114 interviews). Sample consisted of low white-collar workers including administrative clerks, salesmen, service operators, secretaries, technical assistants.

The main conclusion from this research focuses on the relationship between promotion rates and the work-value systems of low white-collar workers. For low white-collar workers the higher the promotion rates the higher the importance of aspects which may satisfy needs for self-actualization. The correlation coefficient between promotion rates and scores on intrinsic values was .606. Low white-collar workers in units with a high promotion rate had an intrinsic value system whereas workers in units with low promotion rates adhered more to extrinsic values. Promotion rates do influence how white-collar workers evaluate their present position and determine their supectations whereas we are do their job and job environment.

Penser, W. H. Managing motivated employees. Personnel Journal, 1971, 50, 367-371.

Theoretical article on job development and enrichment pro-grams. Concludes that successful application implies and de-mands a major restructuring of the management systems of an or-

The workforce of the '70's, especially at the higher levels of education, will not tolerate the traditional, narrowly defined 'employees' role. They will no longer unquestionably accept the organizational party line and will no longer stand silently by while their business lives are controlled and manipulated from above. They will not permit the organization, no matter what its intentions, to subjugate their individuality, their freedom of expression or their will. This will occur whether or not job development is introduced into an organization. What job development can do is to provide a vehicle and a sedium through which these changes can be introduced in a systematic and orderly faminon. It allows management to address the problems with enough lead time so that it can learn new approaches while unlearning outmoded ones. This lead time will also allow for a gradual implementation so that alternative strategies can be tested and developed without disrupring day to day operations. In addition, job development represents a tangible approach to solving problems which are inherently ambiguous and obscure. Moreover, job development activities can be used as a springboard from which a variety of non job related actions can be developed and implemented.

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Pepinsky, P.N., Pepinsky, H.B., & Pavlik, M.B. The effect of task complexity and time pressure upon team productivity. <u>Journal</u> of Applied Psychology, 1960, 44, 34-38.

An experiment was designed to test the effects of the com-plexity of repetitive group tasks and of varied conditions of time pressure upon the output of structured work teams. Twenty-four three-man teams each performed two practiced assembly tasks, one relatively simple, and the other relatively complex. Time pres-sure was established at three levels of varying the frequency of interspersed oral signals, which announced the time remaining in a given work session. Team productivity was defined as an adjusted total of the number of operations performed on each task.

interaction between task complexity and time pressure is not supported. There is, however, positive evidence (a) that the teams were more productive when working on a task that was sufficiently complex to reduce boredom, but (b) that, irrespective of task, when changes in time pressure occurred, the effect upon changes in team productivity was curvilinear.

Pervin, L.A. Performance and satisfaction as a function of individual-environment fit. <u>Psychological Pulletin</u>, 1968, 62, 56-58.

Research is reviewed which treats performance and satisfaction as a function of the interaction between the characteristics of the individual and those of the interpersonal and noninterpersonal environments. Relevant theoretical positions are reviewed. Alternative models for the analysis of interactions or transactions between individuals and environments are discussed. The conclusion points to and discusses three questions: (1) Should one consider the perceived or "actual" environment? (2) What units shall we employ and should they be the same units of analysis for individuals and environments? (3) What is the nacure of the processes involved in individual-environment relationships?

Peterson, R.O. Proceedings of the Human Factor Society, 1974, 333-336.

Social scientists and managers outside the human factors profes-sion are encroaching upon the field of industrial job design. They insist that a job must include such work quality characteristics as a meaningful module, variety, employee control, use of valued skills, and direct foodback. It is easy to oppose such qualities through a series of well-accepted human factors, countermeasures and controls, each described briefly. If such opposition is not successful, it may be necessary for human factors specialiets to join and become leaders of the work quality movement.

Petrie, A. Andividuality in pain and suffering. Chicago: University of Chicago Press, 1967.

Presents a theory that individuals vary along a perceptual augmentation-reduction continuum. The augmenters are those who perceptually increased the magnitude of stimuli by some unknown internal profess. Reducers on the other hand minimized the affect of semancy inquiers on the other hand minimized the affect of semancy inquiers on the other augment or reduce stimuli. The reducer is incleant of pain but does not function well when he is confined, isolated, or deprived of stimulation. The augmenter is intolerant of pain and responds better to isolation. Alcohol drugs, and other pain relieving methods affect augmenters and reducers differently. Augmenters have pain relieved by bombardment with other sensory factors to which he reacts.

Alcoholics tend to be augmenters and juvenile delinquent reducers. There is also some support to the hypotheses that reducers have a higher activity level and like contact with other people as compared to augmenters.

Pheysey, D.C., Payne, R.L., & Pugh, D.S. Influence of structure at organizational and group levels. <u>Administrative Science Quarterly</u>, 1970, 61-73.

Compared groups of line managers and supervisors in two organizations having different organizational structures. As was hypothesized, relationships among the members of the groups in the more mechanistic organization were seen as more formal at all levels of the hierarchy, all groups saw themselves as having less autonomy, and the organizational climate was seen as being oriented toward rules and conventionality. Unexpectedly, however, the organizational climate was also seen as developmental, generating at group level greater involvement of managers with the group. The multidimensionality of concepts such as organizational structure and climate is noted, and the complexity of the interrelationships among the various dimensions of these two concepts is stressed.

Philips, M. V. \*Siceilampenfabricken. Work atructuring summary of experiments at Philips-196) to 1968. Philips Personnel Managament Payley, 1968, (Special Issue).

presents a summary of work-structuring projects carried out in forty production departments at the N.V. Phillips Co. in The Metherlands.

The following summary of conclusions are abstracted below:

1. Three forms of restructuring work.

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Job-enlargement generally results in some improvement in quality, productivity and flexibility but seldom occurs in a pure form. The longer the cycle-time, the fewer the nervous complaints and the more positive the attitude of workers to-wards their work and the management. Job-enlargement, however, is generally less appreciated by girls under 21.

Job-rotation, though having disadvantages, such as loss of routine and longer training times, results in advantages such as a better insight into the product and production, greater opportunities for the development of skills, variety of work and chances of promotion. For the group or department it also often means greater flexibility and mutual assistance becomes possible.

Job-enrichment with the aid of elements of maintenance, setting-up and repair, or administration, planning and super-wision, generally yields an increase of productivity which is sometimes spectacular.

## 2. Formation of small work groups.

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Independence of the small work-group creates possibilities for ehortening the "line" and also for more efficient working with indirect labour. Provided the groups are given the means to exercise an organizational function, an independent group has definitely favourable consequences. In such circumstances clear group task-setting and an efficient reporting system with rapid feedback and planning are also necessary.

Local investigation seems to indicate that organization of the work, independence, style of leadership and atmosphere at work are more important for workers than the monotony or lack of monotony of the work.

Shortening of the "line" creates leadership problems at the lower supervisory levels. A change of mentality and a wid-ening of Knowledge are extremely impuritant here. Lower mana-gerial staff occupy a key strategic position in the organization, because their motives, objectives and method of approach are of decisive importance.

Two problems raised by job-enlargement stand out, viz.: the finding of suitable employment for former charge-hands and opportunities for promotion for well-deserving workers.

## 3. Process of organizational change.

A. It is essential that everyone, from the responsible scnior mannger down to, and including, the personnel at the lowest level, should have a clear ides of the organizational premises on the basis of which the changes will be carried out. This is a protracted process in which many existing communication obstacles will have to be overcome and is essentially a training exercise. The senior level, which will have to be able to carry out the changes relatively independently in relation to other divisions, will have to do much more than simply give their support. It will actually have to implement work-structuring as a task of the highest importance. The way in which the changes are put into effect will largely determine the enthusiasm with which people lower down the organizational ladder will cooperate.

A well thought-out plan with objectives, time schedules, etc., is a condition which top management will have to comply with.

E. Organizational changes in which allowance is to be made for the desires and potentialities of workers cannot be achieved without involving those concerned as closely as possible. Even this "involvement" demands a systematic "institutional" approach using steering-groups, work-groups and the works-council.

Careful choice as to the membership of the various groups (not forgetting the desirability of elected representatives at the lower levels) and, if necessary, the creation of work-groups at two levels (one work-group for the main line, several groups for the details) will ensure a great contribution from all concerned. The positive contribution of this method consists whisfly in the concentration of abilities and the motivation of everyone in the organization to participate.

C. The participation of experts is indispensable for workstructuring and their contribution must be fitted in systematically.
The main fields of activity for various specialisms in connection
with a work-structuring project are the determination of objectives,
to set and keep in motion the process of change, to increase the
variety of peasible solutions and to record, measure and magnes the
results. To pehit action on the basis of reliable data, rigourous
empirical research will be necessary, based upon an inter-disciplinary
approach. When attempting to achieve optimum organization, information confined to the social aspects appears to be just as ineffective as that confined purely to economic or technical aspects. Considering all the work still to be done in this field before it is
possible to establish a basis of sound principles and aids, a concentration of the specialist knowledge gained by experience in this
area will be absolutely necessary in the future.

At Philips a contribution of this type means that both the lo-cal chief personnel officer and head of TNO, together with central colleagues such as industrial psychologists, sociologists and econo-mists will all have a part to play. Participation by, and accep-tance of, the specialists will depend on the local situation but could be achieved, for example, by membership of the various groups or by attachment to local management.

D. Organizational change by way of work-structuring is a long-term process and requires great efforts by many people. To view of the scope of this process it is advisable to divide the plan in advance into phases. This will allow progress to be recorded regularly and changes to be, as it were, "batched", or introduced step by step.

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Pink, W. E. Renewed interest in job enlargement. Administrative Management, 1964, 22-23.

Brief discussion of job enlargement and managements current interest. Concludes that recent emphasis on job enlargement is outgrowth of the computer and its gradual unfolding of the total

Pocock, S. J., Sergean, R., & Taylor, P.J. Absence of continuous three-shift workers: A comparison of traditional and rapidly rotating systems. <u>Occupational Psychology</u>, 1972, 46, 7-13.

Complete absence records of 782 shift workers in one factory have been studied before and after a change from a continuous seven day 'traditional' rota to a rapidly rotating 'continental' rota. A comparison between a twelve ronth period before the change and a similar period afterwards showed a rise in certified sickness absence of 36 percent, in uncertified sickness absence of 16 all in absence for reasons other than sickness of 2 percent and a fall in absence for reasons other than sickness of 2 percent. Certified sickness of the insured population in that part of England rose by only 8 percent. Sickness absence commenced most frequently on the night shift under both systems but this became even more marked for uncertified sickness after the change. These results suggest that social acceptability should not be the only factor considered when a change of system is contemplated.

Porter, L.W. Job attitudes in management: Perceived deficiencies in need fulfillment as a function of job level. <u>Journal of Applied Psychology</u>, 1962, 46, 376-384.

Investigated perceived need fulfillment deficiencies in nearly Investigated perceived need fulfillment deficiencies in nearly 2000 managerial positions. Respondents represented all levels of management and a wide variety of companies. Five need categories, chosen to represent a hierarchy of prepotency of needs, were studied. Results showed: (a) Vertical level of position within management had a strong relation to the degree of perceived satisfaction of the three highest-order needs = (Solf-actualization, Autonomy, and Esteem); for these needs, satisfactions increased at each higher level of management. (b) For the two lower-order type needs, (Security and Social) there was no systematic changes in satisfaction in relation to management level. (c) Among the five need categories, Self-actualization and Autonomy were consistently regarded as the least fulfilled needs at all levels of management. at all levels of management.

Porter, L.W. Effects of task factors on job attitudes and behavior. (A symposium)\*. -Personnel Psychology, 1969, 22, 415-444.

Discussed the under emphasis of task elements and characteristics related to the job itself. Gives a brief summary of the three articles included in this symposium. (Alderfer, C.P., 1969) (Lawler, E.E. III, 1969) & [Hackman, J.R., 1969a). Concludes that psychologists should begin to make useful contributions to areas of industrial engineering, production management, and personnel administration. Psychologists should begin dealing with social problems of employment.

Porter, L.W., & Lawler, E.E.III. Properties of organization structure in relation to job attitudes and job behavior. <u>Psychological Bulletin</u>, 1965, <u>64</u>, 23-51.

Review of empirical field studies that have investigated the relationships between properties of organization structure and job attitudes and behavior. The following seven structural properties were examined: Organizational levels, line/staff hierarchies, span wore examined: Organizational levels, line/staff hierarchies, span of control, subunit size, total-organization size, tall/flat shape, and centralized/decentralized shape. At least 5 of 7 variables (with the exception of span of control and centralized/decentralized shape) were found to be significantly related to attitudes or behavioral variables. The following directional relationships seem to be well supported by the research evidence to date:

(1) Positive r between height of organizational level and degree of job and need satisfaction.

(2) Positive r between height of organizational level and perceived necessity for innerdirected type of job behavior.

(3) Positive r between line type organization and degree of need satisfaction.

need satisfaction.

(4) Negative r between subunit size and job satisfaction.
(5) Positive r's between subunit size and absencedism and turn-

over rates.

Indices of need satisfaction seem to be much more strongly corrolated with structural properties than are indices of need importance. On the behavioral side, absentesism and turnover are more clearly rolated to structure than employee output per se. In generatural variables are more related to attitudes than behavioral variables.

Puture research should determine interaction effects of struc-tural properties and conduct field and experimental studies where one or more structural variables are systematically manipulated.

Porter, L.W., & Lawler, E.E. III. Hanagerial attitudes and performance. Homescod, Illinois: Richard D. Irvin, 1968. (a)

Presents a theoretical model which interrelates nine components in an expectancy theory framework. The nine components are as follows: value of rewards to the individual, the perceived probability that effort leads to rewards, the individuals level of effort, his abilities and traits, his role perceptions, his level of performance, the rewards he receives, his perceptions about equitable rewards, and his satisfaction.

Most of the book is devoted to an evaluation of the model in the light of questionnaire data from 635 managers from seven industrial and governmental organizations. Dependent measures were self ratings and supervisory rankings of effort and performance. Bypotheses were tested by the significance of difference between mean performance and effort of managers giving the highest and lowest third of responses to the following independent variables. (1) valence of pay-value of rewards (2) instrumentality-performance reward probability (3) role perceptions.

In general the results offered some support for the main effects of instrumentality and role perceptions. Less support was obtained for hypothesized interaction effects. The following is a brief review and comparison of Porter & Lawler's theory to Vrooms.

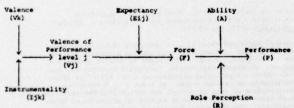
Porter and Lawler, alternatively, hypothesized that performance is a function of the three-way interaction among exerted effort (E), or motivation, ability, and role perceptions (R).  $P = f(E \times A \times R).$ 

Porter and Lawler presented a theoretical treatment of motivation to perform, which is similar to Vroom's except for differences in terminology. Vroom's terminology, and the corresponding terminology by Porter and Lawler, is as follows: force (effort), valence of second-level outcomes (value of rewards), instrumentality (performance-reward probability), and expectancy (effort-performance probability). The latter two form what Porter and Lawler term the effort-reward probability.

Both Vroom and Porter and Lawler hypothesized that the indiwidual's actual performance is additionally dependent upon his ability to perform. Vroom defined ability as characteristics of the individual that represent a potential for performing some task which may or may not be utilized. Similarly, Porter and Lawler defined shility am "relatively stable, long-term individual characteristics (e.g., personality traits, intelligence, manual skills, etc.) that represent the individual's currently developed power to perform." In both models emphasis is placed on the individual's capacity, as opposed to his willingness, to perform at a task.

Porter and Lawler additionally included role perceptions as a determinant of performance. Role perceptions are defined as the direction of effort— the kinds of activities and behaviors the individual believes he should engage in to perform his job successfully. Evaluation of these behaviors by his supervisor, however, is dependent upon the supervisor's role perceptions for the job. This suggests that accuracy of role perceptions may be a more important performance determinant than the individual's role perceptions per se.

The following chart diagrams the theoretical model.



Porter, L.W., & Lawier, E.E.III. What job attitudes tell about motivation. Harvard Business Review, Jan-Feb, 1968, 118-126. (b)

Study of relationship between job satisfaction and performance. Satisfaction with a job may not directly affect performance, but does show if company is revarding employee properly. Study of managers in five companies is one of first satisfaction-performance studies to use executives. Analysis of value of reward, and effort-reward, and effort-reward, and effort-reward expectations influence of effort towards performance, and how employer can use these attitudes to improve performance.

Porter, L.W., & Steers, R.H. Organizational, work, and personal factors in employee turnover and absenteeism. <u>Psychological Bulletin</u>, 1971, 80, 151-176.

Critically examines research over the past 10-12 yrs. concerning factors related to turnover and absenteeism in work situations. On a general level, overall job satisfaction was consistently and inversely related to turnover. In an effort to break down the global concept of job satisfaction, various factors in the work situation were analyzed as they related to withdrawal behavior. Four categories of factors, each representing one "level" in the organization, were utilized (organization-wide factors, immediate work environment factors, job-related factors, and personal factors). Several variables in each of the four categories were found to be related fairly consistently to one or both forms of withdrawal. An attempt is made to put the diverse findings into a conceptual framework centering around the role of met expectations. Methodological considerations and future research needs are also discussed.

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Abstracts (Cont'd.)

Porter, L.W., 4 Stone, E.F. Job characteristics and job attitudes: A multivariate study. Technical Report No. 23, November, 1973, University of California, Contract Nonr N00014-69-A-0200-9001, 151-315, Office of Naval Research.

Determined the extent to which groups of workers formed on the basis of their job title differed from one another on a multi-variate attitude composite.

Attitude data were obtained from 556 employees in a western telephone company. Respondents held one of 16 "craft" jobs in the department selected for study. Multiple discriminant function analysis was performed using 16 groups formed on the basis of subjects job titles. Variables used in this primary analysis included job satisfaction, organizational commitment, motivational force, and sources of organizational attachment. Discriminatory power for the 16 group solution was .65. A secondary analysis was performed in which discriminant function means were related to means of jobs on several job characteristics variables. These two analyses, viewed jointly, suggest that the relatively high discriminatory power achieved in the primary analysis may have been a function of job scope-job attitude relationships demonstrated in the secondary analysis.

Motivational force was found to be different for workers in the sixteen different jobs and was one of the most influential variables in both the third and fourth discriminant function. Results indicated that job complexity was related to workers motivation.

Poulton, F. C. The optimal perceptual load in a paced auditory inspection task. British Journal of Psychology, 1900, 51, 127-139.

A paced auditory inspection task was presented at four levels of perceptual load and three rates of critical signals. The aim was to determine whether there was an optimal range of perceptual load, over which deterioration in performance with time would be minimal. Beyond this optimal range, where the load was either too great (soon producing 'mental fatigue'), or too small (soon producing 'boredom'), greater deterioration was to be expected. The experimental results supported the hypothesis ( $\underline{N} = 96$  males).

The task with the smallest perceptual load presented critical signals only once about every 4 mins, on average. This vigilance task gave significantly more errors than a task with a greater perceptual load and a higher rate of critical signals. Conditions were designed to maintain motivation in both cases. Thus, the poorer performance is unlikely to have been due simply to inadequate motivation.

Poulton, E. C. The effect of fatigue upon inspection work. Applied Ergonomics, 1973, 4, 73-83.

Reviews the literature on vigilance relevant to the factory manager in charge of inspection work or process control. Vigilance experiments with repeated prolonged work sessions are considered, along with studies of the effects of various types of stress (e.g., loss of sleep and heat) on vigilance. Tables summarising the 5 population, vigilance tesk, and results of each of 53 experiments are presented.

Powell, R.M., & Schlacter, J.L. Participative management: A panacea? Academy of Management Journal, 1971, 14, 165-173.

Testing of effects of increased participation in the decision-making process in a non-industrial setting without economic incentives, using a 55 month field experiment with Ohio Department of Highways, Bureau of Traffic's skilled construction and electrical field crews. Responsibility for work schedules was varied. A marked improvement in morale in attitudes toward both motivational and maintenance factors of the work was significant only when the participants assumed entire responsibility for work schedules. Despite the improvement in morale, absenteeism increased in five of the six participative crews.

Powers, J.E. Job enrichment: How one company overcame the obstacles. <u>Personnel</u>, 1972, 49, 18-22.

After an initial failure of job enrichment at a company in California, a new design was developed. A single department was selected and a committee formed composed of management, superintendents, and three first-line supervisors. The committee developed over a hundred methods to expand job responsibilities and variables. These included: (1) Job containing a complete piece work; (2) Person doing the job had control of how he completed the job; (3) Person doing the job was constantly given feedback. Training programs were developed to introduce job changes. After the program was implemented, there was an ll% improvement in units produced along with improvements in quality.

Prien, E. P., & Ronan, W. W. Job analysis: A review of research findings. Personnel Psychology, 1971, 24, 371-396.

Reviews in detail the literature dealing with definitions and measurements of work, including some studies in perspheral areas, e.g., anthropology and sociology. Studies are examined in groups concerned with the following general topics: the determinants of work, methodological approaches to job analysis, job function taxonomies, current research on job analysis, and applications of job analysis results. Future developments are discussed, with emphasis on 6 basic issues for which only partial and inconclusive answers are presently available.

Pritchard, R.D., & Peters, L.H. Job duties and job interests as predictors of intrinsic and extrinsic satisfaction.

<u>Behavior and Human Performance</u>, 1974, 12, 315-330.

The present research develops the argument that actual job duties are a significant determinant of job satisfaction, especially intrinsic satisfaction. It is further argued that the degree of fit between job duties and interests in these job duties should be related to satisfaction. To test these hypotheses, data were collected on job duties, job interests and job satisfaction from 629 enlisted naval personnel on three aircraft carriers and associated air squadroms. The results indicated that satisfaction could be predicted from job duties and that intrinsic satisfaction was better predicted than was extrinsic satisfaction. Only partial support was given to the hypothesis that discrepancy between interests and job duties could predict satisfaction.

Pugh, D.S. Modern organization theory: A psychological and socio-logical study. <u>Psychological Bulletin</u>, 1966, <u>66</u>, 235-251.

Defines "Organization Theory" as the study of the structure and functioning of organizations and the behavior of groups and individuals within them. It is an emerging interdisciplinary quasi-independent science, drawing primarily on the disciplines of psy-chology and sociology but also on economics and to a lesser extent on production engineering. The main lines of development affecting the conceptualization of the subdiscipline can be traced under 6

- Management Theorists (from Henri Fayol to Wifred Brown) Specialization increases efficiency: authority must equal responsi-
- Structural Theo 'ts (from Max Weber to Tom Burns). Bureau-cracy in which authority is exercised by system of rules and proce-dures through the official position in the hierarchy that the individual occupies.
- Group Theorists (from Elton Mayo and Kurt Lewin to Renais Likert). Workers react to non-economic rewards, informal leaders, "Employee-Centered" supervisors, communication and participation in decision making important.
- Individual Theorist (Industrial Fatigue Research Board to March and Simon). Fit the man to the job and fit the job to the man.
   Industrial counseling, selection, training, human engineering, and
- Technology Theorist (F.W. Taylor, Eric Trist, Joan Moodward).
   Techniques involved in achieving goals of an organization, technology,
   Time-study, industrial engineering ergonomics.
- Economic Theorists (from Alfred Marshall to Robin Marris).
   Maximize profits in a competitive market. Econometrics is study of decision making under conditions of uncertainty.

Concludes that organization theory must be left free to find its own problems and develop its own formulations. This freedom must include studying scientific problems rather than only mana-gerial problems and the breaking down of artificial boundaries established disciplines

Pugh P.S. Hickson.D.J., & Hinings C.R. An empirical taxonomy of structures of work organizations. <u>Administrative Science</u> Quarterly, 1969, 14, 115-125.

Presentation of a taxonomy of structures of work organizations based on three proviously established empirical dimensions: structuring of activities, concentration of authority, and line control of workflow. On the basis of a sample of 52 organizations in the English Midlands, clusters of organizations on these three dimensions are examined and a sevenfold classification of organization structures is developed. These are identified as full bureaucracy, nascent workflow bureaucracy, prevention bureaucracy, personnel bureaucracy, and implicity affective organizations. Their characteristic contextual features as to size, technology, dependence on other organizations, and ownership are demonstrated, and a possible developmental sequence is suggested. The results indicate that the concept of a single bureaucratic type is no longer useful, since bureaucracy takes different forms in different settings.

Pugh, D.S., Hickeon, D.J., Hinings, C.R., & Turner, C. The context of organization structures. <u>Administrative Science Quarterly</u>, 1969,

Examination of aspects of organizational context that have been held to be relevant to organizational entructure. Seven primary concepts of organizational context, viz.; origin and history, ownership and control, size, charter, technology, location and dependence on other organizations, were analyzed and operationally defined scales constructed. These were used as independent variables in a multivariate regression analysis to predict three underlying dimensions of organization structure previously established. The size of the correlations obtained on a sample of 46 organizations in the English Midlands (.75 with structuring of activities using size and technology as predictors; .75 with concentration of authority using dependence and location as predictors; .37 with line control of workflow, using the operating variability scale of charter as a predictor) indicates that these aspects of context are salient for structure. The framework of contextual and structural variables is seen as making possible processual studies on a much more rigorous comperative besis than before. Examination of aspects of organizational context that have been

Pym, D. A study of frustration and aggression among factory and office workers. Occupational Psychology, 1963, 37, 165-179.

Study of work attitudes and relationship to the psychology of frustration and aggression. 310 men working in the offices and factories of eight different organizations completed an inventory covering the cause attitude-effect schema of occupational behavior and a sixteen-item picture-frustration study depicting job scenes. The inventory provided a measure of frustration. The frequency of extrapunitive responses in the picture-frustration study provided

The following conclusions were drawns

- Pactory workers scored significantly higher on the measure of frustration than did office workers.
- Unfavourable job attitudes to both intrinsic and social aspects
  of work correlated most highly with the following "indicators" of
  frustration: looking for another job (.48); the desire to stir up
  trouble (.47); watching the clock (.31); and feeling depressed with
  work (.30).
- There is evidence that the frequency of aggressive responses covaries with the strength of frustration (from .10 to .37).
- It was inferred that the type of frustrations most likely to produce aggressive behavior are those concerned with inter-personal relationships.
- 5. Important differences in aggression were cound between the occupational groups which could not be explained wholly in terms of the differences in frustration derived from work itself. It was suggested that differences between office and factory workers and again between unskilled and skilled workers are due partly to the learning of acceptable aggessive behavior through identification with the work group. The effects of other possible antecedents of aggression are by no means clear. Age, education, the decree of arbitrariness of the frustrating situation, attack and the instrumental value of aggression in a particular situation were each considered. Only the latter proved to have a relationship with aggression which might not have been found by chance.

Pym, D. Exploring characteristics of the versatile worker. Occupational Psychology, 1965, 19, 271-278.

Study of 117 semi-skilled female operators engaged in machining operations in the manufacture of sportswear. In 1962, transporters (mechanical handling equipment) were installed to centralize supply and dispatch of materials and improve the work flow. The installation of these transporters increased work variety and operators became responsible for inspection and quality. Fifty machinists worked on each conveyor unit. Piece rates were increased.

Results indicated that 6 months after the change 13% of the operators were producing less than they were before the innovation. Twenty months after the innovation, 2% of the operators were producing more, 7% no improvement, and 11% were less effective.

Operators who had a favorable attitude to change, a broader pattern of leisure interests, and a desire for autonomy were more versatile and able to adapt to the change. This was contrasted with workers who engaged in equilibrium oriented behavior, a preference for regularity and order in one's working life, a dislike of unpredictable circumstances and limited and conventional interests. The desire for homeostasis increases with age.

Quinn, R. P. What makes jobs monotonous or boring. Paper presented at Bird Annual Convention of the American Psychological Association, Chicago, Illinois, August, 1975.

Study of 370 workers employed by three different companies. Sample included managers, clericals, and operatives. Workers were interviewed in hones and observed on job using observation method of Jenkins, Nadler, Lawler, and Cammann (1975). Five aspects of observed tasks were used as predictors of monotony and boredom: (1) number of different tasks performed by worker; (2) durations consisted of mean time of task computed over total number of tasks performed; (3) repetitions, number of times the most frequently repeated task was repeated; (4) ratio of durations and repetitions (duration of each task in minutes was divided by number of times task was repeated). These ratios were then summed over all tasks performed; and (5) entropy - p log\_pp, where p was the proportion of the work period dovoted to the task.

Monotony and boredon were measured by two questions asked of the workers. Intelligence was estimated by the interviewer and off-the-job activity was the amount of participation in activities not related to work.

Task characteristics expressed in various ways were significantly related both to the perception of monotony and to feelings of boredom. They were, predictably, most strongly related to the observers' perceptions of monotony in the jobs they observed, somewhat less strongly related to workers' own perceptions of monotony in their jobs, and least strongly related to workers' feelings of horedom.

The poorest observational predictor of monotony and boredom was the number of tasks performed during the observational periods. The best and most parsimonious predictor was the number of times the most frequently repeated task was repeated, with the duration of the average task a close second. Neither of the conceptually and mathematically more crnate estimators of task variety-that is, entropy and the ratio of durations and repetitions—was superior to the simple measure of repetitions as a predictor of perceived monotony. Nor was either significantly related to workers' feelings of boredom.

Intelligence had no significant effect upon the association between job characteristics and either monotony or boredom. The moderating effects of intelligence were confined to the relationship between perceived monotony and feedings of boredom. That is, monotony was more closely associated with boredom among more intelligent works The moderating effects of off-the-job activity were likewise stronges on the relationship between perceptions of monotony and feelings of boredom, with the latter two variables being more strongly related among workers who were more active off their jobs.

Geiwitz's (1966) experimental tests and synthesis of these approaches identify cognitive arousal and environmental constraint as the two major determinants of boredon. relegating tepetitiveness to an equivocal position. Job enlargement programs often involve many simultaneous organizational and task changes. Geivitz's theory would suggest that what should be altered in such programs should, oddly enough, not be variety, either exclusively or even principally. Instead, it should be yet another of Nackman and Lawler's core dimension—autonomy. Even matters commonly dismissed as palliatives in job redesign—such as music at the workplace—have afirm psychological base as possible reducers of boredom in Geiwitz's theory.

That the effects upon boredom of jobs that were perceived as monotonous were smallest among less intelligent and socially active people than among others has some disturbing practicel implications. If social activity is simply an indicator of alienation, it is alterable by social change. It may, however, reflect instead extroversion-introversion, and in doing so, there are some plausible links between Geiwitz's (1966) cognitive arousal approach to boredom and Eyenche's (1957) explanation of introversion-axtroversion in terms of excitation-inhibition theory. Suppose, then that "enlarged" and "enriched" jobs are allocated principally to those who will be most responsive to them.

Where the allocation criteria are intelligence and introversionextroversion, the criteria of allocation are in part genetically determined. Such allocation, while beneficial in intent, may be Orwellian in effect.

Quinn, R.P., & Shepard, L.J. The 1972-73 Quality of Employment Survey. Ann Arbor, Michigan: Survey Center of the Institute for Social Research, 1974.

The purpose of this research inquiry was to provide for the description, interpretation, and continuous monitoring of the quality of employment.

The principal sims of the survey were the following:

- To assess the frequency and severity of work-related problems experienced by employed people, with special emphasis on those types of problems that were or might become matters of public policy.
- To indicate which major demographic or occupational groups were most affected by these problems.
- To develop economical measures of job satisfaction suitable for use with samples of workers in heterogeneous occupations and suitable for use under a variety of conditions of census and research.
- To asses the impact of working conditions upon the wellbeing of workers.
- To establish base-line statistics that might permit subsequent national surveys to reveal any trends in the content areas originally investigated.
- To establish normative statistics that might permit other investigators to compare with national norms their data from more limited subsamples of workers (e.g., in particular occupations, organizations, or regions).

Comparisons made between the 1969 Survey of Morking Conditions and the present survey showed that few significant changes occurred in worker's needs and attitudes. Increasing numbers of workers have become locked into their jobs. Experiments with working hours, job enlargement and job enrichment have made no appreciable impact on national statistics.

Quinn, R.P., Staines, G.L., & McCullough, M.R. Job satisfaction: Is there a trend? Manpower Research Monograph, 1974, 10.

This report reviews some of the major research on job satisfaction that has been conducted in the past 40 years. The information is presented in five major sections that deal with the following topics: national trends in job satisfaction, demographic & occupational distributions of job satisfaction, motivational assumptions about what Americans look for in their jobs, the implications of job satisfaction or dissatisfaction for workers, employers, and experiments to improve working conditions. Some of the more significant observations in the report are:

- In spite of public speculation to the contrary, there is no conclusive evidence of a widespread, dramatic decline in job satisfaction. Reanalysis of 15 national surveys conducted since 1958 indicates that there has not been any significant decrease in overall levels of job satisfaction over the last decade.
- Job satisfaction among blacks and other minority groups has been consistently lower than that of whites, but has fluctuated as much as 13 percent in the past 11 years. These changes do not correspond to any consistent pattern and are most probably due to sampling error.
- 3. Younger workers are less satisfied with their jobs than older workers, but this has been true for the past 15 years. Therefore, the much-discussed large recent decline in job satisfaction of younger workers has not been substantiated.
- 4. Among occupational categories, professional-technical workers managers, officials, and proprietors register the highest levels of job satisfaction, while operatives and nonfarm laborers register the lowest. Nondomestic service workers and clerical workers are also among the relatively dissatisfied, a factor of potential importance since these workers represent a growing sector of the labor force.

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- 5. Women workers, by and large, are about as contented with their jobs as are men. But it appears that women workers with one or more children under 6 years of age in their households are significantly less satisfied than are either women without preschoolers in the household or male workers in general.
- 6. Among workers without a college degree, there is little relationship between educational level and job satisfaction. Those with college degrees, however, have high levels of job satisfaction. Surprisingly low levels of satisfaction are registered by workers with some college education but no degree.
- 7. When asked to identify the individual facets of the job which were of greatest importance to them, most workers in a national ample gave high ratings to the availability of the resources needed to perform well and to the challenge of their jobs and lower ratings to financial rewards and "confort" factors. Blue-collar workers, however, tended to consider pay more significant than the challenge of the job, while women workers were somewhat more interested in "comfort" than were men.

Because the "average" American worker appears to seek many things simultaneously (e.g., good pay, interesting work) from each job there may be no one way to increase job satisfaction.

- 8. A long list of job-related stresses have been implicated in various types of physical and mental illnesses, indicating that expressions of job dissatisfaction may be viewed as an important early varning system to both employees and employers.
- 9. There is no convincing evidence of the existence of a direct cause-effect relationship between job satisfaction and productivity. In reality, the contribution of job satisfaction to productivity is probably indirect and more likely to be reflected in reductions on the "cost" side of the corporate ledger than in increases on the output side. These indirect beliefs are associated with reductions in turnover, absenteeism, alcohol and drug abuse, sabotage and theft-all of which have been linked to some degree with job dissatisfaction.
- 10. Most recent experiments concerning such currently disputed matters as the impact on worker's attitudes of changing work schedules and job redesign have been conducted and evaluated too unscientifically to permit any reliable estimation of their success.

Rabideau, G.F. Field measurement of human performance in manmachine systems. <u>Human Factors</u>, 1964, <u>6</u>, 663-672.

Field evaluation of human performance is rapidly assuming a role of major importance in system measurement. However, the special conditions under which such ecological tests must be performed impose certain limitations upon the evaluator which must be recognized. These limitations involve restrictions on the opportunity to manipulate variables, which lead to greater use of subjectively-orientated data collection tools: e.g. the human observer, the interview and checklists. Factors to be considered in the planning of a field test are discussed.

Randall, R.F. Job enrichment ensures savings at Travelers, Ranagement Accounting, 1973, January, 68,69,72.

Brief review of job enrichment projects at Travelers Insurance Company involving clericals in an accounting department. Clerical jobs were restructured and combined into natural work units and clerks were given responsibility for reconciling errors and contacting clients. Supervisors were free to concestrate on training and supervision. During the period June 1971 to June 1972, errors, backing and complaints were drastically reduced. There was a 23% reduction in overtime and estimated analysed savings attributable to increased productivity in this one unit was reported to amount to 100,000 or 20% improvement. This cost savings was made possible by a reduction in staff. There was also a wast reduction in complaints received.

Reif, W. E., Perrassi, D. N., & Evans, R. J., Jr. Job enrichment: Who uses it and why. <u>Business Morizons</u>, 1974, <u>17</u>, 73-78.

Survey of 300 of the top 1000 industrial firms regarding use of job enrichment. (See Luthans and Raif, 1974.)

Reif, M.E., & Luthans, F. Does job enrichment really pay off? California Management Review, 1972, 15, 30-37.

A theoretical analysis of job enrichment in terms of worker motivation, job design and resistance to change. Specifies neglected areas of job enrichment: (1) alienated workers who find need satisfaction outside work; (2) negative impact of job enrichment in some workers, who value security and low level competency; (3) uneven trade off of improved job design but reduced social interaction.

Reif, W.E., & Schoderbek, P.P. Job enlargement: Antidote to spathy. <u>Management of Personnel Quarterly</u>, 1966, 3, 16-23.

Report the results of a survey of companies regarding their use of job enlargement. Questionnaires were mailed to 276 companies. Replies were received from 210, and of these, 41 said they had used job enlargement. The most popular reasons for undertaking job enlargement were cost reduction and profit increase. Twenty-three respondents checked "increase in job satisfaction" as an advantage of job enlargement. It is significant that only 23 of 41 companies which used job enlargement noted an increase in job satisfaction in spite of (a) the popularity of the traditional notion that workers want larger jobs, and (b) the opportunity for bias in this sample.

Reif, W.E., & Tinnell, R.C. A diagnostic approach to job enrichment. MSU Business Topics, 1973, 21, 29-37.

This article explains a simple, yet effective, method of job evaluation that will assist the decision maker in choosing jobs that have the greatest possibilities for enrichment. Management is en-couraged to take a diagnostic approach to selecting jobs for enrichcouraged to take a diagnostic approach to selecting jobs for enrichment. A job's potentiality for enrichment is dependent primarily on four sets of organizational variables: the job itself, technology, the workers, and management. Analysis of these variables, and selecting jobs on that basis, is recommended as one of the best ways of increasing the probability that job enrichment projects will be successful in meeting the dual criteria of job satisfaction and productivity.

Reppucci, N. D., Dean C. W., & Shunders, J. T. Job design variables as change measures in a correctional facility. American Journal of Community Psychology, 1975, 3, 315-325.

Study of 39 staff members of a state training school for delinquent boys. These staff members worked directly with the bin one of six residential living units or cottages. A modified version of the Hackman-Lawler Job Design Inventory was used to measure the staff's attitude toward nine job dimensions: variet autonomy, task identity, feedback, contact, informal contact, paticipation, information, and learning.

At the time this scale was administered, the school was in the process of changing from an "internally oriented custodial" facility to a "community oriented rehabilitative" one based on a social learning model. All staff employees under the new model wore expected to take more responsibility, to receive more direct feedback in the quality of work, to participate in developing the rehabilitative program and to learn methods of behavior change and to participate actively in all aspects of the milieu treatment.

At the first administration of the attitude scale, two experimental social learning (SC) cottages had been ongoing for 8 months, while 4 other cottages were operating as benevolent custody (BC) units. Fourteen months later, after BC staff had been trained and BC cottages converted to SL cottages, the job inventory was readministered.

following four hypotheses were confirmed:

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- At the time of the first job inventory, the two SL cottages would score significantly more positive on the job dimensions than would staff members of the four BC cottages.
- There would be no difference between ratings of staff members of the SL cottages over time.
- Once converted to the community oriented social learning system, the staff members of the BC cottages would significantly increase their rating on the job design inventory.
- At the second job inventory, there would not be any dif-ference between the original SL cottages and BC cottages.

Results indicated that enriched jobs were significantly higher on autonomy, task identity, feedback, participation, and informatic The Si cottages did not show a decrement over time (14 months) in the pb dimensions. Authors argue that the long-range follow-up allows one to negate the role of demand characteristics or the Hawthorne Effect in explaining differential job ratings.

Riccobono, J.A., & Cunningham, J.W. Work dimensions derived through systematic job analysis: A replicated study of the Occupation Analysis Inventory. JSAS Catalog of Selected Documents in Psychology, 1974, 4, 145 & 146.

One phase of a broader research project is reported. The project was designed to develop and test an Occupation Analysis Inventory (OAI) that contained 622 work elements (items) describing various kinds of work activities and conditions. The purpose of this study was to derive a comprehensive set of work dimensions (factors) that could be used in describing, comparing, and classifying jobs and occupations for educational and quidance purposes. A sample of 400 jobs representing the percentages of jobs in the major occupational categories of the Dictionary of Occupational Titles was rated on the OAI work elements. Two sets of OAI ratings were obtained on a subsample of 134 jobs for reliability purposes. Seven separate factor analyses were performed on groupe of items (work elements) contained in the following sections of the OAI: (a) information received, (b) mental activities, (c) physical work behavior, (d) representational work behavior, (e) interpet wonal work behavior, (f) work goals, and (g) work context. The item reliabilities were adequate, and the results of the seven sectional factor analyses were generally meaningful. Of the 81 factors emerging from these analyses, 77 were interpreted. Although some potential applications of the OAI factors are discussed, both the stability and utility of these dimensions remain to be demonstrated. to be demonstrated.

In a previous study, work dimensions (factors) were derived from ratings of a representative sample of 400 jobs on an Occupation Analysis Inventory (OAI). The OAI contained 622 work elements describing various types of work activities and conditions. A follow-up to this study is presented here. The first objective of the follow-up study was to determine the stability of the originally-derived factor structure through a replication of the original factor analyses with a new sample of 400 jobs. The second and third objectives involved the derivation of first- and higher-order factors, respectively, from the OAI ratings of a combined sample of 800 jobs. Evidence of factorial stability was obtained through factor comparisons across the two samples using Tucker's coefficient of congruence. The results of these analyses (though comparable to those obtained in a previous study employing a similar instrument and similar procedures) were not as favorable as expected. It was noted, however, that the factors derived from a combined sample of 800 jobs were likely to be more stable than those obtained from the two smaller samples. Pactor analyses

employing OAI ratings of the total sample of 800 jobs were performed on seven separate sections of OAI work elements. These seven analyses yielded 88 interpretable factors. The first-order factors were then subjected to a factor analysis which produced 22 interpretable higher-order factors. The factors obtained in this study are subject to a different interpretation than the factors obtained in an earlier study in which OAI work elements were intercorrelated on the basis of estimated attribute-requirements were intercorrelated. ment profiles. The implications of this difference are discussed.

Rice, A.K. Productivity and social organization in an Indian weaving shed. Human Relations, 1953, 297-329.

Describes a preliminary analysis of the sociotechnical system of the Callo Mills in India. The company manufactures finished cloth from raw cotton and employs approximately 8,000 workers. The following is a summary of conclusions.

- An experimental automatic loom shed which contained 224 looms was manned by twenty-nine workers, of whom twenty-eight were concerned directly with the manufacture of cloth and one with artificial humidification.
- 2. The activities of a single automatic loom are cyclic-load, weave, unload-and require the successive performance of tasks to carry them out. The activities of a loom shed containing a number of looms are continuous, and require the simultaneous performance of tasks to maintain the continuity.
- The weaving process had been broken down into component sks and the number of workers allocated to different tasks had sen determined by work-studies of the separate components.
- 4. The looms in the shed were differentiated into nineteen different loom groups of five kinds which overlapped in different degrees. Each kind of loom group contained a different number of looms-groups which were manned by a different number of workers.
- All tasks of the manufacturing process were interdepende but the workers performing them worked in different kinds of loom groups and had, therefore, different degrees of interdependence. were virtually independent of each other.
- 6. The resultant pattern was of an aggregate of individuals with confused task and wo er relationship and with no discernible internal group structure. This resultant was compared and contrasted with the longwall method of coalmining in which job breakdown in a predominantly cyclic process had led to a similar lack of internal work-group structure but with splitting and segmentation rather than confusion.
- Change of sort (kind of cloth woven) led to a restructur-ing of some kinds of loom group and in consequence to a change in the pattern of relationships.
- 8. Higher management had provided reinforcement for the governing system of the shed. This, and the high quality of the relationships between supervisors and between supervisors and workers, had prevented any overt difficulties resulting from the lack of group structure, but in the shed efficient was lower and damage was higher than target figures.
- 9. In spite of the persistence of "weaver" as a title for an occupational role the weaver was the loom, and all workers, including the "weavers", serviced the muchines. The tasks performed were found to be differentiated into two main groups: those concerned with short loom stops (after a simple yarn break) and those concerned with long loom stops for loading and unloading and loca maintenance, for meel intervals and between shifts).
- 10. An analysis of changes in the numbers of workers with change of sort showed that relatively stable numbers could be obtained for each of three main groups of sorts-coarse, medium, and fine-and that provided some tasks could be considered interchangeable no changes in worker groups would be required for changes within the main sort. The theoretical numbers required for blocks of sixty-four looms, into which the loom shed was divided by physical boundaries, were calculated.
- 11. Three natural grades within a worker group for sixty-four looms were found. They were designated by letters only, rates slight-ly in excess of existing rates were fixed for these grades and it was decided to pay piece rates to the whole group.
- 12. It was decided by higher management to discuss with mill shed management and the workers the organization of one experimental work group for a group of sixty-four looms.
- 13. Shed supervisors and workers spontaneously took possession of the reorganization, and the workers themselves immediately organ-ised four experimental groups. Higher management took no part in the discussions with supervisors and workers and permitted that experimental groups so chosen to start work.
  - 14. The results of the experiment (a) The creation of internal

    - The results of the experiment were:

      (a) The creation of internally-structured and internally-led small work-groups.

      (b) A reduction in the number of those reporting directly to the supervisors and a consequent strengthening of the executive command.

      (c) The beginning of the withdrawal of higher management

    - (c) The beginning of the withdrawal of higher management from the governing system of the shed.
       (d) Old occupational role titles were abandoned but new titles were not chosen. Five months afterwards both tasks and roles were still known by the letters designating the grades.
       (e) After an immediate increase in mean efficiency in the experimental groups at the cost of increased damage and inadequate maintenance, a settling down at a new level of performance in which efficiency was higher and damage lower before reorganization.

15. These results could not, in the time available, be related to the general ecological background of economic, industrial, or cultural conditions in India, nor because of language difficulties could any direct evidence of the workers' attitudes and feelings be obtained. The only evidence of "goodness of fit" was the apontaneous acceptance, implementation, and continuation by the workers and the withdrawal from the governing system of the shed by higher management.

16. The rest of the shed showed some evidence of the incidence of forces of induction, but this evidence could not be followed up in the time available. The experimental period finished when a partial third shift was started. No adequate information was available of repercussions in the rest of the mill.

17. Although, therefore, all the effects cannot at present be related to their causes, and the analysis has not yet been followed completely through, it seems fair to conclude that the findings reported had a direct relationship to the event of reorganization. The exploration has led to arrangements for future collaboration. It is hoped, therefore, to follow up the experiment.

Rice, A.K. Productivity and social organization: The Ahmedabad experiment. London: Tavistock Publications, Ltd., 1958.

This work, which falls within the general field of 'operational' research, is concerned specifically with the interaction of social, economic, and technical change processes in an Indian textile mill employing over 8,000 workers. The locale is unimportant; the implications for industrial organizations everywhere are far-reaching and compelling. The book makes available the results of more than three years of experiment leading to social and technological changes having highly significant effect upon one another and upon productivity. It offers insights that will guide and stimulate those who are concerned with the problems of a developing industrial and social organization in the widest context. In it will be found much food for thought and many patterns of procedure relevant for readers as various as industrial managers and employers, technicians, trade unionists, administrators in many types of organization; as well as social scientists professionally concerned with this field.

Richman, I.S. The differential reaction to a simulated participative job redesign as a function of intrinsic-extrinsic need orientation, Unpublished Doctoral Dissertation, Case Western Reserve University, 1972.

The study presented here explores, through the use of a case study simulation, an aspect of the relationship of the individual to the work situation. The Motivation-Hygiene theory was used to provide a basis for understanding and measuring individual need orientation, and to relate job redesign intervention preferences to individual need orientation.

The primary hypothesis of this study was that intrinsically oriented individuals will react more favorably to job redesign interventions dealing with intrinsic job aspects than will extrinsically oriented individuals while, conversely, extrinsically oriented individuals while, conversely, extrinsically oriented individuals. Need orientation was operationalized by an instrument requiring 5 to give reasons in support of his preferences for various occupations. Job redesign intervention preference was determined by having each S respond to a case study problem based upon an actual job enrichment intervention, which offered a series of job intrinsic and extrinsic solutions. A trend was found, as predicted, that intrinsically oriented Ss tended to prefer attrinsic job redesign interventions, and extrinsically oriented Ss tended to prefer extrinsic job redesign interventions. This trend was not statistically significant and the hypothesis could not be accepted. However, many of the circumstances occurring in this experimental simulation could act to attenuate these results, and thus it is felt that this hypothesis may be confirmed through future studies in non-simulated situations.

A related hypothesis, indicating that self-esteem would be an intervening variable between need orientation and job redesign preference, such that the relationship predicted in the first hypothesis would be confirmed only for high self-esteem individuals, was not accepted. However, a trend did appear such that while there was no apparent relationship between needs and preferred job redesign interventions for low self-esteem individuals, there was such a relationship in the direction predicted by the first hypothesis, for high self-esteem Ss.

The final series of five hypotheses sought to relate the measure of need orientation used in this study, the Job Preference Inventory (JPI) to selected scales of Ghiselli's Self-Description Inventory. Statistically significant correlations were found, as hypothesized, between JPI scores and scores on scales of achievement and self-assurance (positive correlations) and security (negative correlation). These findings were felt to provide support for the validity of the JPI.

The results also indicated that the sample of ROTC students (N=103) serving as Ss tended to be intrinsic in need orientation and showed an overall stronger preference for the intrinsic job redesign interventions as opposed to the extrinsic interventions.

While caution must be exercised in generalizing from all of these results to what may be expected in a non-simulated situation, it is indicated that individual differences approaches to jdb redesign interventions are potentially fruitful. Rimoldi, H.J.A. Personal tempo. Journal of Abnormal and Social Psychology, 1951, 46, 283-303.

Study of the natural tempo of individuals working in their most natural, congenial way (N = 91 males).

The variety of tests employed covered a relatively large field of different psychobiological functions. If all these functions could be explained in terms of one single factor, this result would give atrong support to the monistic viewpoint.

Results were as follow:

It is not possible on the bases of one or two isolated speeds to predict speed in other psychological functions. The postulation of a general factor of tempo that could be used for the purpose of prediction, seems to be unwarranted in the present stage of our knowledge. There are a number of factors involved.

The practice of determining an individual's tempo by means of one or several tests of tapping is unsatisfactory. If a general tempo factor exists, its influence is very limited due to the existence of definite clusters of speed.

Individuals seem to be constant through long periods of time in their tempo characteristics. Each S seems to adopt a certain temporal pattern for a particular group of activities, and this is the best definition of his "personal tempo."

Robey, D. Task design, work values, and worker response: An experimental task. <u>Organizational Behavior and Human Performance</u>, 1974, 12, 264-273.

Sixty subjects participated in an experiment to test the hypothesis that job satisfaction and performance are affected by the interaction of task design and work values, as suggested by Hulin and Blood (1968). Two routine decision tasks computer coding were performed by subjects classified as having either intrinsic work values or extrinsic work values. Findings support the hypothesis that the interaction between job content and work values affects job satisfaction. Performance data partially support the hypothesis. The job enlargement thesis is thus shown not to be generally valid but rather affected by individual differences of subjects. Subjects with extrinsic value structures responded more favorably to specialized tasks. Subjects with intrinsic derived more satisfaction from the hand solution.

Roche, W.J., & MacKinnon, N.L. Motivating people with meaningful work. Harvard Business Review, 1970, 48, 97-110.

Introduced a program of meaningful work into Civisions of Texas Instruments. The program included a series of meetings between workers and supervisors. In the meetings, the groups identify work problems, determine who is to solve these problems, and report on progress made in problem areas discussed at earlier meetings. To be successful, the supervisors must adopt the system, the workers must realize that management is working with them, and top management must give the program top support. The program was not a complete success but seemed to follow an all-or-mone pattern. In the groups where the program was successful, it was outstanding -- in those groups where it failed, it did so in three months or less.

Roethlisherger, F. J. & Dickson, W. J. Management and the Worker. Cambridge: Harvard University Press, 1939.

Report of experimental studies of human relations conducted at the Hawthorne Works of the Western Electric Company in Chicago from 1927 to 1932. At the beginning of the studies the general interest was primarily in the relationship between working conditions and fatigue and monotony among employees. The investigation was expanded to include the workers attitudes. The book is divided into five parts: (1) Morking conditions and employee efficiency (2) A plan for the improvement of employee efficiency (2) A plan for the improvement of employee relations-(interviewing programs) (3) A conceptual scheme for understanding employee dissatisfaction (4) Social organization of employees (5) Application of the re-

Ronan, W.W. The relationship of personality and aptitude factors. Experimental Publication System, 1969, 1, Ms. No. 089C. (a)

Study to demonstrate possible relationships among known personality and aptitude factors. The 16 PF Test (Form C) was the personality measure used; the Flanagan Aptitude Classification Tests were used for cognitive tests. Although only one personality variable showed a meaningful relationship, a factor analysis of the correlations was done. The conclusion was that personality traits may show relationships to only restricted aspects of aptitude tests, and that more appropriate studies need to be designed to measure these relationships.

Ronan, W.M. The relative importance of job characteristics. Experimental Publication System, 1969, 1, Ms. No. 007A. (b)

Reports survey study of 241 employees at all levels of an organization. Ss completed a questionnaire developed to measure attitude toward and importance of different job characteristics. Results indicated that there was substantial agreement between management, salaried and hourly employees on the importance ratings of job characteristics. The job characteristic with the highest importance rating was satisfaction from good work.

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Ronan, W.W. Individual and situational variables relating to job satisfaction. <u>Journal of Applied Psychology</u>, 1970, <u>54</u>, (Monograph Ro. 1, Part 2), 1-31. (a)

Collected data for a sample of 1,310 managerial-supervisory, 3,641 salaried, and 6,212 hourly employees concerning job satisfaction using 32 items from a questionnaire. In the same organization, data descriptive of work units and behaviors in the units (as tardiness) were collected. The two sets of data were intercorrelated and factor analyzed. In general, little relationship was found between satisfaction and behaviors. Where such a relationship was found the link appeared to be direct supervision. It was also found that behavioral measures load on more than one factor, the interrelationships are extremely complex, and it is recommended that future analyses concentrate on the study of individuals. This latter is to enable a more stringent analysis of the complex network of variables apparently involved. variables apparently involved.

Ronan, W.W. Relative importance of job characteristics. Journal of Applied Psychology, 1970, 54, 192-200. (b)

Discusses a review of past research that has shown several Discusses a roview of past research that has shown several common sources of job satisfaction. However, less work has been done on the relative importance of the various sources. In this study, a sample of Managerial-supervisory (N=1,311), Salaried (N=3,653), and Hourly employees (N=6,192) rated 68 job characteristics for importance. Considerable agreement was found in the ratings, in particular, as to the most and least important characteristics. Disagreements largely seem related to the nature of the work by a particular employee group. Another facet of the study has shown that different methods of measuring importance yield different results.

Rose, A.M., Pingerman, P.W., Wheaton, G.R., Eisner, E., & Kramer, G. Methods for predicting job-ability requirements, II ability requirements as a function of changes in the characteristics of an electronic fault-finding task. Technical Report II, August, 1974, American Institutes for Research, Contract Nonr N00014-72-C-0382 NR 151-347, Office of Naval Research.

This report describes the second study in a program of research dealing with the relationships between the characteristics of human tasks and the abilities required for task performance. The goal of the program is to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. Such knowledge has important implications for both selection and training of presents.

As the second step in this program, the present study investigated the relationship between variations in an electronic fault-finding task and consequent changes in the abilities related to fault-finding performance. Characteristics of the fault-finding task were manipulated by varying formal difficulty and perceptual complexity. Subjects received a battery of reference ability tests and then proceeded to perform the criterion task under the different experimental conditions. To determine the relationship between task characteristics and ability requirements, the reference battery was factor analyzed to identify a reference ability structure. The loadings of the various criterion task conditions on that structure were then estimated. ere then estimated.

Five separate ability factors were identified. Four were found to be related to criterion task performance. One seemed to be in-wolved to the same extent across alternative versions of the task, while others increased or docreased as the task characteristics were manipulated

Rosenfeld, M., & Zdep, S.M. Intrinsic-extrinsic aspects of work and their demographic correlates. <u>Psychological Reports</u>, 1971. 28, 359-362.

Used an objective paper-and-pencil instrument to identify 1, Used an objective paper-and-pencil instrument to identify 1, 963 intrinsically and extrinsically oriented employees at each of 3 job levels. Analyses were conducted to determine the demographic correlates of this distinction. Results indicate that intrinsically oriented groups at the supervisory and salaried non-supervisory levels tended to be younger, better educated, and have more dependents than their extrinsically oriented fellow employees. Of the variables investigated, level of education possessed the largest consistent relationship with the intrinsic-satisfic criterion. extringic criterion.

Assential, M. Application of human engineering principles and techniques in the design of electronic production equipment. Human Factors, 1973, 15 (2), 137-148.

The Mean Engineering Group was asked to investigate a seeding operation considered by management to be a seeding operation considered by management to be a seed of the construction of the seed of th

Rosow, J.M. (Ed). The worker and the job: Coping with change. Englewood Cliffs, N.J.: Prentice Hall Inc., 1974.

Participants of the Forty-Third American Assembly (The Changing World of Mork) concluded in their final report "improving the place, organization, and the nature of work can lead to better work performance and a better quality of life in the society." This book contains a scries of essays exploring the attitudes and expectations of todays worker and describes the conflict between a society that is changing rapidly and a workplace that is not.

The opening section of this volume provides an overview of the cultural, sociological, and economic situation of the American worker, from the changing work othic to the increase in the number of young, minority, and women workers. Next, contributors examine the causes of worker dissatisfaction and its economic results-low output, rising absenteeism, and even sabotage.

In the concluding section, contributors examine the future of work. These articles review the current steps being taken to restructure work and offer a discussion of the responsibilities that government, unions, and employers share for finding a healthy balance between profits and people.

Walton's chapter on innovative restructuring of work compares sand contrasts 12 pilot job enrichment projects at the following dif-ferent companies (Non Linear Systems, Donnelly Mirrors, Corning Glass, General Poods, Alcan, Advanced Devices Center-Northern Electric, Shell UK, Norsk Hydro, and Volvo).

Rotter, J. Generalized expectancies for internal versus external control of reinforcement, Psychological Monographs, 1966, 80, 1-28.

The effects of reward or reinforcement on preceding behavior The effects of reward or reinforcement on preceding behavior depend in part on whether the person perceives the reward as contingent on his own behavior or independent of it. Acquisition and performance differ in situations perceived as determined by akill versus chance. Persons may also differ in generalized expectancies for internal versus external control of reinforcement. This report summarizes several experiments which define group differences in behavior when Ss perceive reinforcement as contingent on their behavior versus chance or experimenter control. The report also describes the development of tests of individual differences in a generalized belief in internal-external control and provides reliability, discriminant validity and normative data for 1 test, along with a description of the results of several studies of construct validity. studies of construct validity.

Quota restriction and gold bricking in a machine shop. The American Journal of Sociology, 1951-52, 57, 427-442.

Examined production behavior of industrial workers by participant observation. It is seen that loafing on the job may not be the simple line of inactivity that some students of the subject have thought it. Close scrutiny of the particulars of "soldiering" in one piecework machine shop resuled that group adherence to a "bogey" was but one of several kinus of output restriction in the repertoire of machine operatives and that the work group was restricting production day in and day out.

Rush, H.M.P. <u>Behavioral science, concepts</u> and management application. New York: The Conference Board, 1970.

Focuses on program started in 1966 at the Syntex Corporation in Mexico City, Mexico, and Research Center, Palo Alto, California. The innovativeness of scientists was not being utilized. Team work groups were formed "where employees set own standards and quotas". Results showed less skepticism, more volunteering, more introspection, instantaneous feedback, managers more concerned with career paths -- career planning of employees, and rank-and-file employees appeared more committed and involved. Volume sales in the two experimental groups increased by 116% and 20% over control groups.

Rush, H.M.F. Job design for motivation. New York: The Conference Board, 1971.

Examines the cultural and technological evolutions that have Examines the cultural and technological evolutions that has atimulated job design research and applications. It discusses the historical and theoretical influences on the job design movement, the predominant methods of job design and an analysis of company and union experience with job design in application including guidelines for and barriers against job design.

Seven case studies are presented to demonstrate multiple approaches to motivation through job design. The seven cases included various job enrichment projects at the following com-

(1) PPG Industries

Reports results of a program instituted in 1967 at the P.P.G. Industries in Lexington, N.C. for 675 twist frame operators to solve problems of loss of efficiency in twist frame machines because frame cleaning was dirty, repetitive and routine work. Technique used was el inated of the frame cleaner job. Machine operators took over the cleaning function for their own machines. Results showed an increase in morale and an increase in productive by 128. tivity by 12%.

(2) Monsanto

Focuses on solution to problem of high employee turnover among new hires at the Electronics Division of Monsanto in West Caldwell, N.J. Forcemen were given responsibility for interviewing, indoctrinating, and giving skills training to new hires. Results showed significant drop in turnover rate.

A program in 1968 at the Textile Division of Monsanto Chemical in Pensacola, Florida was started for 50 chemical operators. Problem was that rising production costs beest the automated control room for chemical reaction and conversion. Technique used was four employee "task forces" (one from each shift), restructured certain jobs and eliminated some dirty jobs through automation. Operators then managed their own restructured jobs. Results showed that employee suggestions increased 300% and waste loss dropped to zero. Operators monitored 50% more instruments and need for half of the old supervisors was eliminated.

States results of a job-enrichment program in 1967 at the Agriculture Division of Monsanto at Muscatine, Itwa for 150 machine operators. Problem was a production "bottleneck" in the Dagging section. Seminars were held with employees who analyzed their own jobs and made changes. Production goals were set by baggers. Results showed that production increased 75% in four sould be a supervisors.

(3) Weyerhauser
Gives results of a plan begun in 1968 for 300 paper production employees of the Weyerhauser Co., Tacoma, Washington. To attempt to solve problem of low productivity, technique of "I Am Manager of My Job" plan was used, based on the assumption that all people want to be responsible, to succeed, and can manage their own jons best. Results showed that employees became very enthusiastic about the challenge of their new jobs, and productivity increased. tivity increased.

(4) Araphoe Chemical
Pocuses on technique used to increase productivity and
morale at the Araphoe Chemical Company in Boulder, Colorado.
Started in 1968, 125 employees were given more responsibility
for an entire project. Results showed increased productivity
and prompt meeting of deadlines on customer orders.

(5) Texas Instrument

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Discusses program begun in 1967 at Texas Instruments, Inc., in Dallas, Texas for 120 maintenance personnel. Problem was 100% quarterly turnover and failure to get buildings clean. Morkers were organized into 19 member cleaning teams. Each member had a voice in planning, problem-solving, goal-setting, and scheduling. Pesulta were a quarterly turnover drop from 100% to 9.8%. Personnel requirements dropped from 120 to 71. Cost savings averaged \$103,000 yearly between 1967-1969. Building cleanings ratings increased from 65% to 85%. cleanliness ratings increased from 65% to 85%.

(6) U.S. Internal Pavenue Service
Discusses controlled enrichment project for tax examiners
GS-4, 5 & 6 grades. Tax examiners were giving responsibility for
verifying and editing their own work, designating work leaders,
appointment of consultants and specialists and weekly group
seetings. Job charges produced mixed results. Production rates
were higher for GS6 control non enriched groups and GS4 & 5
experimental group. No difference between experimental and control
groups were found in error, rate or motivation. Concludes that
the job changes were superficial and insignificant. Employee
involvement was low to begin with and maintenance needs were not
met.

(?) Valley Mational bank Reports job enrichment modifications for check encoders and check reconcilers. Project did not report statistical data.

Salancik, G.R. Interaction effects of performance and money on self-perception of intrinsic motivation. <u>Organizational Behavior</u> and <u>Human Performance</u>, 1975, 13, 339-351.

The self-perception hypothesis that payment for performance of an interesting task decreases intrinsic motivation was tested on a roadracing task under various conditions of performance. Performance was controlled to give subjects the experience of reaching criterion after producing either many errors (poor performance) or few errors (good performance), N=78 (male college student). Good performers reported liking and enjoying the task more when not paid for their performance than when paid; poor performers reported greater liking and enjoyment which puld than when not. On the other hand, good performers were more satisfied with their performance when paid than when not and attrabuted their performance more to their personal strategies; 'he opposite was the case for poor performers. This latter finding contradicts the hypothesis that subjects decrease their intrinsic motivation when paid because payment detracts from their feeling of personal causation. An alternative interpretation is that subjects are less intrinsically motivated when the task is perceived as easy relating to their ability. Supporting that interpretation, the present study found that good performing low error subjects perceived the task as less difficult than poor performing high error subjects, and, in addition, paid subjects perceived their experimence on the task to be greater than did unpaid subjects.

Saleh, S.D. Anxiety as a function of intrinsic-extrinsic job orientation: The presence or absence of observers, and task orientation: The presence or absence of observers, and task difficulty. <u>Journal of Applied Psychology</u>, 1971, <u>55</u>, 543-548.

Divided ninety-six intrinsically job-oriented and 96 extrinsically job-oriented male university students into four comparable subgroups. Two subgroups worked on simple anagrams, one alone and one observed by two individuals of higher status. The other two worked on difficult anagrams under the same two conditions. Felt anxiety and perception of task difficulty ratings were elicited along with reactions toward the experimental conditions. The intrinsically oriented expressed more uneasiness than the extrinsically oriented while being observed on the difficult anagrams. They also tended to perceive the task as more difficult when observed than when alone, while the opposite was true for the extrinsically oriented. The importance of job orientation in the reaction to the presence or absence of observers was discussed.

Saleh, S.D. Development of the job attitude scale. Unpublished. Department of Management Sciences. University of Waterloo, 1971. (b)

Reports on construction and development of Job Attitude Scale (JAS) which consists of 16 job related statements, each statement paired through s forced choice paradigm with the other 15. The purpose of the scale is to develop measures of intrinsic and/or extrinsic orientation. Test-retest reliability was .88. The abbreviated form was shown to have similar results. Significant correlations were found between JAS and personality variables of dominance, socialibility, social presence, sense of well being, and tolerance. Maslow's hierarchy of needs was also correlated. No difference between males and females in mean intrinsic scores. Large differences were shown between high school and college educated groups.

Saleh, S.D. The nature of supervision and its effects on indi-viduals working on simple and difficult tasks and differing in job attitude. Symposium presented at NATO Symposium - Leader-ship and Management Appraisal, Brussels, August, 1971. (c)

Demonstration of importance of extrinsic vs. intrinsic orientation in relation to supervision and leadership. Two levels of task variables were manipulated, simple versus difficult. It was expected that individuals would prefer and be more attentive when working on a task which is consonant with their dominant job orientation. Solution of anagrams was used as the experimental task. The Job Attitude Scale was used to measure job orientation, with a post-experimental questionnaire to measure satisfaction and anxiety. 192 lat year university male students participated. Results showed a two-way interaction between job orientation and supervision on difficult task and showed expected interaction with regard to satisfaction. Two levels

Saleh, S.D., & Brown, M. Effects of intrinsic vs. extrinsic job orientation and reported anxiety under task conditions. <a href="mailto:Canadian Journal Behavioral Science">Canadian Journal Behavioral Science</a>, 1972, 4, 43-49.

Out of 428 male first year university students, 96 intrinsically oriented (10) and 96 extrinsically oriented (20) were identified. Each group was divided into four comparable subgroups. Two of the subgroups attempted to solve 40 rimple anagrams, one clone and one observed, while the other two worked on 10 difficult anagrams under the same two conditions. Each of the 8 subgroups was further dichotomized into 12 low anxious and 12 high anxious 8s. The experiment involved a 2 (10 ws. EO) x 2 (low ws. high anxiety) x 2 variance design. The results showed that low anxious EO 5s performed better than high anxious EO 5s in all conditions, while the low anxious IO 5s performed better than the high anxious IO 5s only in the alone simple task condition. No significant differences were found with regard to satisfaction.

Saleh, S.D., & Grygier, T.G. Psychodynamics of intrinsic and extrinsic job orientation. <u>Journal of Applied Psychology</u>, 1969, 22, 446-450.

Studied personality correlates of intrinsic and extrinsic job orientation using 136 employees in a social service organization. Results are presented for general intrinsic orientation as well as for specific factors included in the two broad categories. Results indicate that concern with intrinsic factors signifies approach tendencies, while concern with extrinsic factors points to avoidance tandencies.

Saleh, S.D., & Hyde, J. Intrinsic vs. extrinaic orientation and job satisfaction. Occupational Psychology, 1969, 43, 47-53. (a)

A mail-back attitude survey among 600 employees included the hypothesis that greater general satisfaction would be expressed by those whose orientation is toward intrinsic job features. Six work factors in each category were ranked. The hypothesis held. Greater intrinsic orientation was found among men, plus a positive relationship with job complexity and employee education.

Saleh, S.D., & Hyde, J. Trends of job satisfaction along the age dimension. Experimental Publication System, 1969, Issue 1, Ms. No. 031A, 1-16. (b)

The present study was conducted to investigate the relationship between age and satisfaction with various aspects of the job, and with overall satisfaction. An attempt was made to overcome a criticism (Quinn 4 Kahn, 1967) of the Saleh and Otis (1964) study, this being the use of a retrospective question asking proretires to rank the age periods in terms of most and least satisfaction with their jobs. This criticism stems from the finding of Hardin (1965) that indicated that a retrospective questionnaire asking employees to recall a change in job satisfaction over a six-month period did not measure accurately the actual change as measured at the beginning and end of the period. Although the subjects in the Saleh-Otis study were not required to recall changes in satisfaction, the validity of the retrospective question is uncertain.

The data reported here were part of an attitude questionnaire admainistered to half the employees of a predominantly white collar type organization. Sampling procedure was simply to select every other name from an alphabetical list of 1200 employees employed at the time of the study. The questionnaire was distributed to the selected 807 employees who were asked to return it to an agency outside their organization.

The results of the present study do not support the hypothesis of Herrberg et al. (1957) or the findings of Soleh and Otis (1964), since the trend analysis of the overall measure of job satisfaction along the age variable was not significent. It is however important to mention that this study is based on a static rather than a dynamic developmental approach. The subjects indicated their satisfaction with a particular job at a specific time. No account, for instance, was made for differential rate of turnover due to dissatisfaction among the various age groups. Besides the approach does not allow the individual to compare the level of his satisfaction in different age periods.

The results also show that the general measure of job satisfaction is a composite one which combines the effects of at least two types of variables, intrinsic and extrinsic.

Saleh, S.D., & Lalljee, M. Sex and job orientation. Personnel Psychology, 1969, 22, 465-471.

Reports three studies of the distinction between intrinsic and extrinsic job orientation with regard to the sex variable. First study with a college population showed no sex difference in job orientation. Second study used a working population and controlled for job level again showed no sex differences. The third study used employees of a large service-oriented organization, with age, job level, and education controlled. No sex difference appeared. However, when these variables are not controlled, a significant difference is jound between clerks and supervisors.

Saleh, S.D., & Otis, J.L. Sources of job satisfaction and their effects on attitudes toward retirement. <u>Journal of Industrial Psychology</u>, 1963, <u>1</u>, 101-106.

The present study is an attempt to explore the relationship between sources of job satisfaction of a group of pre-retirees and their attitudes toward their mandatory retirement. The sources of satisfaction considered are "job related" factors and "context related" factors. The job related factors were found to contribute to positive intrinsic satisfaction as they satisfied the individual's needs for self-actualization and psychological growth. On the other hand, the context related factors did not have any appreciable positive effect, but contributed largely to the prevention of dissatisfaction (Hertberg and Kamlin, 1961; Saieh, 1963). It follows that the job orientated individuals will receive true satisfaction from their jobs, while the context orientated will not. On these grounds, it is hypothesized in this study that job orientated pre-retirees would be less satisfied with their coming retirement than the context orientated.

Saleh, S.D., & Pasricha, R. Job orientation and job tenure.

Proceedings of the 78th Annual Convention, American Psychological

Association, 1970.

Administered a questionnaire to 3,628 employees of a large, predominantly white-collar organization to test the hypothesis that those new on a job would be more intrinsically oriented than those who have been on their jobs for a longer period of time and have "mastered" the challenge. Age, sex, education, and salary level were controlled. The results basically support the hypothesis, with a possible confounding - education.

Saleh, S.D., & Pasricha, V. Job orientation and work behavior. Academy of Management Journal, 1975, 18, 638-645.

Investigated relationship between job orientation, job mobility and self development. Sample included surveys from 4,379 employees of a large mainly white collar organization (Survey return = 76% of original sample).

Results indicated that in a high salaried male group (over \$10,000) job change which was defined as number of jobs held was related to intrinsic orientation. The more the job change, the higher the intrinsic orientation. This relationship was not found in the low salaried group (under \$10,000). In the male low salaried group, for the high school educated workers, taking a course related to their jobs on their own initiative was related to intrinsic orientation. This relationship was not found among university educated worker or higher salary group.

Saleh, S.D., Prien, E.P., Otis, J.L., & Campbell, J.T. The relation of job attitudes, organization performance and job level. Journal of Industrial Psychology, 1964, 2, 59-65.

Survey questionnaires were administered locally to personnel of two plants of a company division. While the plants were several hundred miles apart, the locations were markedly similar in size of city, degree of industrialization and commercial development, and in fact, major physical characteristics. The plants were also similar in size, number of employees, make-up of the work force in terms of skill and the nature of the work.

The employees to whom the survey questionnaires were administered were in two job classes; hourly employees and salaried employees. The level of job difficulty ranged from unskilled entry jobs to technical and professional positions.

The results of the study point up two important conclusions regarding employee attitude in relation to efficiency. First, a positive relationship between job attitudes and efficiency is more clear-cut for hourly than for salaried groups, suggesting that the relationship is a complex one that might be affected by a variable such as job level. And second, that the two salaried groups have more favorable attitudes than the hourly groups in spite of the different situational factors (efficiency) reported for the two plants, suggesting that job level affects job attitudes in a specific direction.

Saleh, S. D., 6 Singh, T. Work values of white-collar employees as a function of sociological background. <u>Journal of Applied Psychology</u>, 1973, 58, 131-133.

More than 3,000 employees indicated their job orientation by ranking 6 intrinsic and 6 extrinsic factors. Father's occupations, the size of cormunities in which they worked, salary level, education, and sex were identified. In the low-salaried group (<510,000), 5s whose fathers held primarily unskilled jobs were less intrinsically oriented than 5s whose fathers held primarily technical jobs. The latter group was, in turn, less intrinsically oriented than 5s with professional fathers. A positive relationship between intrinsic job orientation and community size was also found for the low-salaried group. No differences in job orientation were found in the high-salaried group as a function of either fathers' occupation or community size.

Sales, S. M. Need for stimulation as a factor in social behavior. Journal of Personality and Social Psychology. 1971, 13. 124-134.

Recent experiments suggested that individuals classified as "reducers" on the kinesthetic aftereffects task are particularly likely to seek out and respond favorably to complex, interesting, and intense stimulus situations. Conversely, these studies indicated that individuals classified as "augmenters" by this procedure are particularly likely to seek out and respond favorably to quiet, dull, and simple stimulus situations. These differential tendencies appear to stem from differences among individuals in a putative need for atimulation. The present paper sketches a theory which would account for these data, and it describes four experiments which investigated various remifications of this theory. The studies indicated that individuals high in measured need for stimulation (s) react favorably to interesting stimul; (b) attend closely to complex verbal communications, (c) exhibit high levels of activity in a deprived stimulus situation, and (d) show high levels of talking in a group discussion.

Sales, S. M. Need for stimulation as a factor in preferences for different stimuli. <u>Journal of Personality Assessment</u>, 1972, 16, 55-61.

Recent investigations have indicated that "reduttion" on the kinesthetic aftereffects (KAE) procedure may indicat migh levels of a putative need for stimulation (nStim), while "augmontation" on this procedure may indicate low levels of this motive. The present study supports the interpretation of the KAE task as a measure of nStim by indicating that "reducers" on this measure (a) react favorably to complex auditory and visual stimuli and (b) expose themselves particularly frequently to complex and intense stimulation in their ongoing social activities.

Sales, S.M., Guydosh, R.M., & Iacono, W. Relationship between "strength of the nervous system" and the need for stimulation. Journal of Personality and Social Psychology, 1974, 29, 16-22.

Research has suggested a relationship between the need for stimulation, as measured by the kinesthetic after effects task, and tendencies to "reduce" or "augment" incoming stimuli. Unfortunately, previous results are unclear. In Study I, college students (N=99 male 12 females) with high auditory thresholds (who presumably reduce incoming stimulation) were particularly unresponsive to simple stimuli. In both simple and moderately complex stimulus situations, high-threshold subjects were more bored and expressed less enjoyment and interest than did low-threshold subjects, presumably because neither situation involved truly complex stimuli. These "insensitive" subjects also were particularly likely to drink coffee (a stimulant) and to have been born and raised in urban settings. In Study II, (N=17 males I) ifenales) high-threshold college students appeared earlier for the experiment during the quiet summer session than did low-threshold subjects. They slso placed especially many figures in a highly iteractive model social setting compared to the number of figures they placed in a less interactive setting, relative to the numbers placed by more sensitive subjects, before judging the setting overcrowded. These results suggest that high-threshold subjects have a greater desire for social stimulation.

Sandler, B.E. Eclecticism at work, American Psychologist, Oct., 1974, 767-773.

This article reviews several approaches to job design. These approaches are: 1) job enlargement, which includes enlargement, enrichment, and participative decision making; 2) modified work-weeks; 3) the increasing importance of problem finding and problem formulation: 4) a psychology of responsiveness to employee needs (as determined by the employee himself). Within each of these approaches relevant literature is reviewed.

The approach which promises the greatest amount of responsive-ness to employee needs (as determined by the employee himself) is the cafeteria approach, where the employee selects from among a number of rewarding alternatives (e.g. salary increases, more vacation time,increased benefits) which are most appropriate for him. In order for this approach to be successful, the organization must learn to recognize the legitimacy of certain behaviors and needs with which it might disagree.

As the organization learns to implement more effective ways of meeting employee needs, it is likely to be rewarded with the type of improved performance for which it has been searching.

Sauer, J. The relationship between informative feedback and goal-setting. Experimental Publication System, 1970, 4, MS No. 120 A.

Sample consisted of 120 Ss. aged 18 thru 37, who performed a Sample consisted of 120 Ss, aged 18 thru 37, who performed a task of adding 3-two digit numbers. The study investigated the interrelationships between the observable effects of informative feedback and its goal-setting, or cognitive, effects. Four conclusions were derived, 1) Unlike Locke's studies, results indicated at least one significant feedback effect and no significant goal effects. 2) Little support was found for Locke's assumption of informative feedback and the effects it has on behavior. 3) Variability in performance was a function of the effects of beginning ability rather than a function of goal-setting or feedback. 4) The effects of goal-setting and feedback are more complex than proposed by Locke.

Schmidt, B. J. Prediction of success in clerical occupations from ability test scores. The <u>Vocational Guidance Quarterly</u>, 1975, 24, 68-71.

12.

Study of all 1972 stenographic graduates of high schools in three sections of Virginis. All were employed in clerical occupations one year after graduation and they had not completed their education beyond high school.

Results indicated that ability level (SCAT) was not related to scilateotroness scores [supervisors] ratings]. An inverse relationship was found between ability level and job satisfaction. Low ability clericals were more satisfied with their jobs. The trend toward dissatisfaction with clerical work as ability level increases lends support to the theory that ability level is a moderator variable in the work situation.

Schneider, B. Conceptualizing organizational climate. Techn Report No. 7, May 1974, University of Maryland, Contract Nonr R00014-67-A-0239-0025, Office of Nava' Research. (a)

Part I of this paper presents some logical and conceptual distinctions hetween job satisfaction and organizational climate, the former being viewed as micro, evaluative, individual perceptions of personal events and experiences: the latter as macro, relatively descriptive, organization level perceptions that are abstractions of organizational practices and procedures. Part II proposes a formal definition of climate as meaningful perceptions (concepts) people share and which function to help adapt people to their organization. The Structuralism, Functionalism and Cestalt schools of psychology were each reviewed and the implications of each school for the definition of climate and climate research methods and theory were indicated. Perhaps the most interesting "finding" was a hypothesis derived from Functionalism on the impact of an organization's "climate for individual differences" on individual attribute - individual performance relationships. Some conditions leading to a "climate for individual differences" in which individual differences in performance should be predictable were identified.

Schneider, B. How do your climates show? Let us count some ways. Technical Report No. 8, July 1974, University of Maryland, Contract Bonr B00014-67-A-0239-0025, NR 151-350, Office of Neval Research.

some "hidden" consequences of an organization's goals, practices and procedures on the climates created for employees are reviewed. First some potential impacts on climate and eventual employee behavior of a lack of fit between goals and means to obtaining the goals are explored, especially with reference to differences between product and service - intensive industries. Then some implications the climates an organization creates for its employees are examined with respect to the attraction and retention of employees. Finally the kinds of organizational climates created for the reward and support of individual differences in ability and personality are discussed with reference to the predictability of employee performance. Probing these ideas leads to the conclusion that organizations must take a broad systems approach to thinking about the effects, both intended and unintended, of the goals they choose and the practices and procedures they implement ling specific practices and procedures will show in many ways.

The same of the sa

Schneider, B. Grganizational climate: Individual preferences and organizational realities revisited. Technical Report No. 9, July 1974, University of Maryland, Contract Nonr N00014-67-A-0239-C025, Office of Naval Research. (c)

The fit of new agent (N = 194), life insurance agency climate expectations and preferences to the realities of the climate of the agency they joined (N = 125) was correlated with new agent success (tenure and sales) one year after hire. The correlations were essentially zero. Further analyses suggested, however, that for one cluster of agencies (a "positive" type of agency) the better the fit between expectations and realities, and in another cluster (a "negative" type of agency) the poorer the fit of preferences to realities, the higher the probability of new agent success. It was hypothesized that previous findings indicating positive outcomes for new employees who have realistic expectations may be an artifact resulting from basically "positive" organizations permitting researchers to tell new employees what it is "really" like in the organization.

Schoderbek, P.P., & Reif, W.E. Job enlargement: Key to improved performance. Ann Arbor Burcau of Industrial Relations, Graduate School performance. Ann Arbor Burcau of Industrial Relations, of Business Administration, University of Michigan, 1969

A major portion of the book is the report and analysis of a survey of a random sample of U.S. companies listed in the 1965 Portune Directory. Out of 276 companies whom the four-page questionnaire was sent. 210 replies were received. The questionnaire began with: "Is your company now using or has it ever used Job Enrichment?" Companies replying in the negative were asked if they had ever considered it or were considering it for the future, and what their reasons were for not using it now. Over 89 per cent (1969) of the companies did not use job enrichment. The remaining 41 companies went on to answer questions about the reasons they had undertaken job enlargement, en number and kinds of jobs involved, the advantages or disadvantages of the approach, the ranking of criteria used in determining its success, and a rating of their experience.

Most of the reported effort was concentrated on repetitive types of jobs. This is to be expected when the definition emphasizes reduction of monotony.

The criterion of primary concern in estimating success with job enlargement was "profit." Employee attitude, quality, and output were considerably lower in ranking. Unfortunately, the only evaluations of success here are the opinions of the respondents as to what advantages job enlargement had for them, such as an increase in job satisfaction and a reduction in costs. Results from some earlier studies are reported. Reduction in turnover and its relationship to employee satisfaction on one hand, and to costs, productivity and quality on the other hand, was not discussed.

Schoenfeldt, L.F. Utilization of manpower: Development and evaluation of an assessment classification for matching individuals with jobs. <u>Journal of Applied Psychology</u>, 1974, <u>59</u>, 583-595.

A model for the assessment of individual characteristics, the identification of psychological requirements of jobs, and the classification of applicants to job opportunities was developed. The validity of the model was investigated with a large sample of students (N=1,934) working toward a college degree. Subgroups, formed on the basis of previous behavioral data collected during the freshman year, differed with respect to criteria (arts-sciences vs. applied studies, grade point average, etc.) measurements taken four years later. More importantly, the subgroups differed with respect to the curricular paths walked during college. The results indicated that it was possible to differentiate people in meaningful ways, to identify "joh families," and to match people with jobs.

Schoonard, J.W. & Gould, J.D. Field of view and target uncertainty in visual search and inspection. <u>Human Factors</u>, 1973, <u>15</u>, 33-42.

This study is aimed at an improved understanding of the inspection of miniature computer components. It was found, for complex stimuli simulating integrated circuit chips, that subjects (M = 6 females) failed to detect over half of the targets in a 15-or 16-sec. visual-scan interval. Defects were usually detected quickly or not at all. Removing the time constraint by extending the visual scan interval to 2-minutes did not substantially improve detection performance. The elimination of target uncertainty, by placing targets on all stimuli and informing subjects of this fact prior to search, had no apparent effect on inspection errors. Bestricting the field of view of subjects to a series of small areas of the stimulus did not enhance the detection of the targets used in this study. used in this study.

Schoonard, J.W., Gould, J.D., & Miller, L.A. Studies of visual inspection. <u>Ergonomics</u>, 1973, <u>16</u>, 365-379.

This paper describes the results of four experiments in a series aimed at understanding and improving visual inspection in general and of small integrated circuits (i.e. 'chips') in particular. Stimuli consisted of chips that although electrically sound, contained visual anomalies. The first experiment found that the model duration of eye fixations of trained inspectors was about 200 msec. The most accurate inspectors made the fewest eye fixations and were the fastest. The second experiment evaluated the performance of inspectors at one of the many sequential stages of chip inspection and found that 23% of the chips containing anomalies were necepted, whereas only 2% of the chips without anomalies were rejected. When the same chip was judged more than once by an individual inspector the consistency of her judgment was very high whereas the consistency between inspectors was somewhat less. The third experiment showed that variation by a factor of six in inspection speed led to variation of less than a factor of two in inspection accuracy. The fourth experiment showed that inspection via a ground glass screen is only a little worse than the usual method of looking through a binocular microscope. This was true even though the inspectors had no previous experience with the screen.

Schuh, A.J. The predictability of employee tenure: A review of the literature. <u>Personnel Psychology</u>, 1967, 20, 133-152.

Summarizes the literature involving employee tenure to guide archers in developing a testing program for validation against

The following restrictive considerations determined the selection of articles for inclusion in this report:

1. The investigation had to appear in published form. Speeches,
mimeographed papers, etc. were not reviewed.

2. The study had to deal explicitly with permanent worker-position separations (i.e., turnover rather than advancement, demotions,
leaves of absence, etc.).

3. The results of the study had to be reported quantitatively

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and in sufficient detail for the reviewer to determine the statisti-cal significance of the reported results. In evaluating the results of a study the .05 level of significance was adopted as criterion for rejecting the null hypothesis.

This survey did not include hypothesized procedures or resumes of opinions. Rather, information from completed and published quantitative research studies was the domain of this review.

Essentially, this article summarized results of studies on labor turnover in relation to intelligence tests, aptitude tests, interest inventories, personality tests, biographical data, and job satisfac-tion inventories. Recommendations for future research are given.

Schuler, R. Communications: Worker background and job matis-faction: Comment. Industrial and Labor Relations Review, 1973, 26, 851-853.

Reports study of 100 semi-skilled machine operators (50 urban and 50 rural). Area of socialization or worker residence was not related to job satisfaction as measured by Brayfield-Rotho Questionnsire. There was an interaction between area of socialization and current residence which affected job satisfaction. The incongruent combinations of rural residence and urban socialization and urban residence and rural socialization produced more job dissatisfaction than congruent combinations. Replies by Hulin (1973) and Shepard (1973) follow the research report.

Schwartz, H., & Gruenfeld, L.W. Review sssay: Psychological assumptions and Utopian aspirations; A critique of "Work in America". Administrative Science Quarterly, 1975, 20, 126-130.

Review essay discussing work as a source of a worker's melfesteem, identity and sense of order. Concludes that it is apparent,
then, that the psychological functions that work is supposed to fulfill cannot be fulfilled for everybody at all times. This raises an
important point about the recommendation of job enrichment. What we
have accepted from the Work in America report is that lack of selfesteem if correlated with a fenling of not having mastery. If so,
then job enrichment or additional challenge in the job, would be
counter-indicated in these cases. People who don't feel capable of
handling jobs that they hold would certainly not benefit from jobs
that are even more complex. Therefore, job enrichment could easily
aggravate problems such as dissatisfaction, alienation, hostility,
and lack of productivity.

But what about the evidence that increasing numbers of workers want greater challenge in their work? These workers do not lack self-esteem: they have attained self-esteem and find the discrepancy be-tween the triviality of their jobs and their good opinion of themselves disturbing. But these workers are in a different group from those disturbing. But these workers are in the subject of our concern. whose lack of self-esteem is the subject of our concern.

Most importantly, to the extent that work actually is the source of one's self-esteem, the workers with self-esteem attained their self-esteem through their work. But this means that the same work, the mastery of which had provided them with self-esteem, is now felt to be incongrient with their self-enteem. From this, one can conclude that self-esteem is not static, therefore both we and WIA chose the wrong elternative. All work can provide self-enteem, but self-esteem once achieved, may be unstable. Also, the instablity is dynamic, in that it will continually have to be resolved as a function of the degree to which self-esteem is achieved. Therefore changing the work structure does not alleviate the problem, for once the new structure is in place, it can become as inadequate a source of self-esteem for the worker as the earlier structure.

Schwyhart, W.R., & Smith, P.C. Factors in the job involvement of middle managers. <u>Journal of Applied Psychology</u>, 1972, <u>56</u>, 227-233.

Investigated the nature of job involvement (JI) and its relationship to other variables for 149 male middle managers in one company. A replication group contained 58 Ss. Both company satisfaction (CS) and JI were measured using 20-item Likert scales. A significant linear relationship between JI and CS was found in both groups (r=.44, .45). Principal components factor analyses of JI scores for two groups of Ss produced three orthogonal factors that replicated. Because only the first factor, job ambition, was consistent with previous research, it was concluded that the factor structure of JI is occupationally specific. The results were interpreted as supporting the idea that importance of the job to a worker's solf-immage is associated with his satisfaction with the company. Possible relationships of JI to theories of work motivation were discussed.

Scott, R.D. Job enlargement-the key to increasing job satisfaction? Personnel Journal, 1973, 52, 313-317.

Discusses a number of studies that contradict the assumption that job enlargement is a panacea for personnel problems dealing with worker motivation and job satisfaction and suggests that not all workers will respond to enlarged jobs in the same manner. Such variables as the worker's norms and background, his psychological needs and his level of satisfaction with his former job can all affect his response.

Scott, W.E., Jr. Activation theory and task design. Organizational Behavior and Human Performance, 1966, 1, 3-30.

Presents generalization of the activation theory of vigilance behavior to the area of task and job design. The activation theory of vigilance behavior is a physiological explanation of behavior in situations characterized by low levels of stimulation and has been found to summarize much of the literature on vigilance decrement. Briefly, this theory holds that stimulation impinging on the human receptor serve two purposes. One is a cue or information function which is accomplished when the stimulation travels directly to the appropriate cortical projection area. The other is an arousal or activation function and is accomplished when the neural stimulation also travels through the ascending reticular formation and is diffused over a wide area of the cortex. This pathway serves no cue or information function but does serve to maintain the organism at a high state of srousal or activation. Generalizing from the activation theory and the results of vigilance studies. Scott argued that amount and variety of stimulation serve to motivate the werker and enable him to maintain a high level of performance. In short, non-routine, nonrepetitive jobs are likely to serve as positive motivators of behavior.

Seeman, M. On the personal consequences of alienation in work. American Sociological Work, 1967, 32, 273-285.

Reports results of structured interviews of random sample (N=558) of the male work force in Malmo, Sweden, including both manual and Bon-manual workers. Results showed little evidence that alienation in work results in intergroup hostility, anomia, political withdrawal, status seeking, and a sense of powerlessness. The influence of social factors crucial to mass society theory was found to be minimal in its effect on work alienation or the degree of correlation between alienation and generalized outcomes. Those high in alienation had significantly less interest in discussing their work with others. There was some evidence that alienated workers retreat from mobility striving and that high powerlessness was positively related to low political knowledge and ethnic prejudice.

Seeman, M. The urban alienations: Some dubious theses from Marx to Marcuse. Journal of Personality and Social Psychology, 1971, 19,

eviews four widely accepted propositions, concerning four types of alienation (self-estrangement, feelings of powerlessness, social isolation, and cultural estrangement), in the light of evidence from studies conducted in the United States, France, and Sweden. The propositions in question emphasize (a) the personal and social consequences of modern alienated labor, (b) the ceherence of various forms of alienation (i.e., their typical appearance as a syndrome), (c) the lack of community in urban society, and (d) the breakdown of commonly held values in metropolitan life. In each case, the evidence provokes serious doubt about the established wisdom concerning alienation as a totalitarian, one dimensional factor. Author resists this one dimensional pessimism on the basis that the concept of alienation is founded on the following assumptions that are open to serious question; (1) The coherence of various alienated attitudes (2) The generalization of these attitudes across the individuals life space (3) The defeating effects of large scale organization (4) The liabilities of social isolation (5) The scope and intensity of value conflict (6) The centrality of work experience for one's self image and (7) The profound frustration of the worker.

Shagass, C., & Schwartz, M. Age, personality and somatos cerebral evoked response. <u>Science</u>, 1965, <u>148</u>, 1359-1361.

Cerebral responses to stimulation of the median nerve Cerebral responses to atimulation of the median nerve were recorded in 89 healthy subjects, aged 15 to 60 years. Relationships between response characteristics, age, mex, and Maudeley Personality Inventory variables were determined. Amplitudes increased significantly with age. Age interacted with "extraversion" so that more "extraverted" subjects under 20 and fewer "extraverted" subjects under 20 and fewe

An implication is that neurophysiological maturation and aging both tend to occur later in more extraverted individuals.

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Sharlip, A.S. Applying job motivation where it is most needed. Training & Development Journal, 1969, 21, 48-49.

Suggests that research should focus on low-prestige jobs in the public sector, e.g., sanitation workers and policemen, rather than on high-level jobs in private enterprise. It is difficult for a sanitation worker (whose job is low on the attractive occupations scale) to develop pride and satisfaction in his job when the policeman (whose job manks higher as an attractive occupation) is held in low esteem in today's society. This in turn leads to motivation problems. This holds true in the private sector, too, with service type jobs such as chambermaids, porters, and vaiters. It is concluded that despite "our changing society, some essential jobs will have to continue to be done in occupational areas considered unattractive...."

Shaw, D.M. Size of share in task and motivation in work groups. Sociometry, 1960, 23, 203-208.

An experiment was conducted to test the hypothesis that high task motivation is a function of (a) large individual shares in group tasks and (b) identifiability of individual contributions to group products. Subjects in the experimental work groups were 136 female undergraduates recruited from classes at a state university. The following results were obtained:

results were obtained:

1. Subjects with large shares in the group task showed higher task motivation than did subjects with small shares, as hypothesized.

2. Identifiability of individual contributions to the group task was not significantly related to task motivation. There was an indication that the results may reflect inadequacy of manipulation of identifiability as a variable, and should therefore not be construed as a refutation of the second hypothesis.

Shepard, J.M. Functional specialization and work attitudes. <u>Industrial</u> <u>Relations</u>, 1969, <u>8</u>, 185-194.

Review of literature to show that functional specialization is related to work satisfaction. Study conducted to show that a negative relationship between degree of functional specialization and degree of job satisfaction exists. Results show job satisfaction is low among production workers on mechanized setting, higher for monitors, and still higher for craftsmen. Indexes of power-leasness, meaninglessness, and autonomy-responsibility were also tabulated and correlated with job satisfaction with a negative relationship for the first two, and strong positive r for the last.

Shepard, J.M. Punctional specialization, alienation, and job satisfaction. Industrial and Labor Relations Review, 1970, 23, 207-219.

Research results involving effects of job specialization and alienation on job satisfaction. Study involved three samples of workers (1) oil refinery control room operators N=109, (2) auto assembly line workers N=120, (3) auto asintenance craftsmen N=143. Samples represented three levels of functional specialization (assemblywhigh, oil control room-medium, craftsmen=low). Job matisfaction was measured by an 18 item 5 point likert scale. Three aspects of alienation were measured. The three aspects were: (1) instrumental work orientation; (2) self evaluative involvement in work; and (3) commitment to organizational goals. Results indicated a negative correlation between degree of functional specialization and job satisfaction. The three aspects of alienation did not moderate or affect the relationships between functional specialization and job satisfaction. A measure of urban or rural community of socialization of the worker did not effect this relationship. Concludes that alienated or not, a worker's job satisfaction increases with job size. Job specialization does not seem to be raceived negatively by only certain segments of the labor force - it appears to be a more general phenomenon than others have suggested.

Shepard, J.M. Automation and alienation. Cambridge: The MIT Press.

Studies three man-machine relationships that were explored in eight different industries. The independent variable was the technology used. Among factory workers working on a mechanized assembly line was associated with the highest perceptions of alienation, as measured by a questionnaire with five scales related to feelings of measured by a questionnaire with five scales related to feelings of powerlessness, reaninglessness, normlessness, self-evaluative involvement in work, and instrumental work orientation. Morkers in all three man-machine relationships perceived the same amount of power-lessness in their work situation. Working in an automated oil refinery was associated with less alienation than were the non-mechanize maintenance tasks. Among office workers, non-mechanized clerks tended to have as much alienation as mechanized office machine operators. Within the automated man-machine relationship, programmers and systems analysts had less alienation than computer operators. Other comparisons of alienation as related to automation and technology of jobs are given, as defined by the five scales of the questionnaire.

Shepard, J.M. Alienation as a process: Work as a case in point. Sociological Quarterly, 1972, 13, 161-173.

Tested a theoretical framework predicting that the lack of perceived status recognition within a status structure promotes social psychological withdrayal from that status structure. Scales of powerlessness, meaninglessness, and normiessness, self-evaluative involvement, and instrumental work orientation were developed and were used as independent variables, representing aspects of work status structure and social psychological withdrawal from the work role. Results with 305 oil refinery and autosobile sanufacture employees offer some empirical support for the theoretical framework.

Shepard, J. M. Communications: Worker background and job satisfaction: Reply. <u>Industrial and Labor Relations Review</u>, 1973, 26. 856-859.

Reply to research study on urban rural differences completed by Schuler (1973). Points out that Schuler (1973) only looked at one level of work (workers in highly specialized jobs). In additi-Shepard collepsed Schuler's data and reorganized it and found that there was no difference in level of job satisfaction between those who were econgruent on the residence-socialization dimensions and those who were incongruent. Shepard reiterates that functional specialization depresses job satisfaction regardless of level of alienation among workers. In addition

Sheppard, H.L., & Herrick, H.O. Mhere have all the robots gone?

Morker dissatisfaction in the 70's. New York: Free Press, 1972.

Results of 3 national surveys of white-and blue-collar union members and youthful workers indicate that (a) dinnatia-faction with dehumanizing aspects of technology is widespread; and (b) among monathoritarian workers, this disastisfaction can lead to socially and politically destructive attitudes and behavior. Reports a national survey of workers (i-1,513) where job dissatisfaction was most experienced by black workers under 30 years, young workers with some college, and young women (older males were most satisfied with their jobs). Job satisfaction was related most highly to pleasant surroundings, interesting work, which utilizes workers' aptitudes and provides an opportunity to develop, freedom in the job and good pay and job security. Interviews of 371 white male union workers in four Ponnsylvanic cities and in Michigan, showed 30% were discontented with what they had received in 11cm relative to their appirations. Gwe half of these discontented reported having jobs they didn't want, and jobs low on variety, autonomy, responsibility, and chance for advancement. They also reported having jobs with low opportunities to learn more. Total task scores were found to be related to management emphasis on quality work, and negatively related to desire to change jobs, or retire early. Total task scores were positively related to advancement, while those with low task ratings tended to view advancement, while those with low task ratings tended to view advancement, while those with low task ratings tended to view advancement, while those with low task ratings tended to view advancement.

Shiflett, S.C. Group performance as a function of tesk difficulty and organizational interpendence. <u>Organizational Behavior and Human Performance</u>, 1972, 2, 442-456.

Studied the effects of different organizational strategies on group performance. Two performance criteria were proposed: (1) "effectiveness"—maximum group performance; and (2) "efficiency"—performance per unit of time. One hundred and forty-four Ss worked individually or in dysds using a divided labor, shared labor or free choice strategy. Tasks were a difficult and easy crossword puzzle. The free choice and shared labor strategies were more effective than divided labor. The choice and divided labor were more efficient than shared labor. The same patterns of results occurred on both the easy and difficult tasks. The various strategies and task difficulty produced differences in task satisfaction, interpersonal relations and amount of interaction between Ss with shared labor having the highest ratings and divided labor the lowest ratings on these variables. The effects of amount of interaction and task difficulty were discussed with respect to group performance and member satisfaction. Studied the effects of different organizational strategies on

Shils, E.B. <u>Automation and industrial relations</u>. New York: Holt, Rimehart & Winston, 1963.

A thorough, systematic, and objective presentation of both fact and opinion concerning the controversial subject of Automation. Shile presents an array of data that provide the material necessary to assess the impact of automation on society, not only on union management re-lations.

He has provided a common core of information that will have great utility for personnel or labor relations specialists in industry, for policy makers within union structures, and for academicians concerned with the analysis of industrial relations phenomena.

Perhaps Shils' objective reporting approach may have, in the long run, a greater impact than a more theoretical or speculative volume would have had. No reader will be able to dismiss Shils' volume as being either predjudicial or characterized by 'cloud nine' idealism. Rather, they will get a precise survey of highly pertinent information that may sid them to approach the crucial problems inherent in automation in an informed and objective fashion, with an increased potential for realistic cooperation being the end product.

Siassi, I., Crocetti, G., & Spiro, H. Loneliness and dissatisfaction in the blue collar population. <u>Archives of General Psychiatry</u>, 1974, 30, 261-265.

Psychiatrists, sommitized by recent publications describing "blue collar blues" among assembly line industrial workers, may attribute the workers complaints of emotional distress to the stress of the assembly-line environment. A field survey of automobile workers (N=888 and their wives), engaged in production-line tasks reveals no more evidence of unrelatedness, loneliness, boredom, life-dismatisfaction, work dissatisfaction, or depression than among their spouses. Mhere these phenomena occur, they are usually part of a broader pattern of emotional illness characteristic of disgnosed patients drawn from the same population. Mental health professionals should be cautious about stereotypes less they impair their clinical judgement.

Siegel, A. I. & Pfeiffer, M. G. Personnel psychophysics. J. Catalogue of Selected Documents in Psychology, 1975, 5, 315. Manuscripts 1072, 1073, 1074, 1075, 1076. J5AS

The results of several previous studies of Applied Psychological Services are first incorporated into a model of the job of the avionics technician. Evidence is presented that is purported to support the content, concurrent, and predictive validity of the model. A study into the psychophysical relationship between perceived circuit complexity and an objective, physical measure of circuit complexity is presented. The implications of the results of the psychophysical study for the model and for the personnel subsystem are discussed.

Siegel, A.L., & Ruh, R.A. Job involvement, participation in decision making, personal background and job behavior. Organizational Behavior and Human Performance, 1973, 2, 318-327.

Investigated the moderating effects of personal background on the relationships between participation in decision making and job involvement (JI) for 2,628 employees from 6 manufacturing organizations. JI was significantly (p(.01) correlated with participation in decision making, community size, and turnover. The correlations between JI and performance, absenteeism, and education were not significantly different from zero. As hypothesized, the correlation between participation in decision making and JI was significantly (p(.01) g-eater for individuals with more education than for those with less. Contrary to predictions, the correlation between participation in decision making and JI was also significantly greater for more urban individuals than for less urban individuals. Results are interpreted as supporting a "complex man" theoretical position with respect to the interaction between the individual and the organization and as indicating the need for further research on the determinants and consequences of JI.

Simon, C. W. Rapid acquisition of radar topics from moving and static displays. <u>Human Factors</u>, 1965, <u>7</u>, 185-205.

Aerial-reconnaissance radar imagery can be presented to an observer for near-real time interpretation in two ways: as a continuously moving display or in discrete, static steps. Both were studied in a laboratory experiment designed to determine their effect on the probability and speed of target acquisition (N = 12 observers). The results indicated: (1) no significant differences in the number of real or false targets acquired, (2) significantly less time required to find a target on the moving display, and (3) the time difference increased as targets became more difficult to recognize and as the available observation time increased. The relevance of this study for equipment design considerations and the generality of the results to other near-real-time reconnaissance missions are discussed. It is concluded that even among a wide variety of conditions not included in this study, where targets are of simple, well-defined patterns capable of recognition with little study, the moving presentation mode—is balance—will result in better target acquisition performance.

Simonds, R. H., & Orife, J. N. Worker behavior versus enrichtheory. Administrative Science Quarterly, 1975, 20, 606-612.

Report of study of voluntary intraplant job transfers completed in 1973 at two Michigan plants (one was located in a large city, employed 950 workers, and produced medical surgical products: the other plant was located in a small town, employed 350 workers, and produced office furniture).

Voluntary job transfers involved 71 non-supervisory workers. In 51 of the 71 pairs of jobs, employees transferred to jobs with increased pays only 4 moved to lower pay. The majority of the higher paid jobs to which the workers moved were more enriched, but when the job shift did not provide a pay increase, no preference was shown for the more enriched job. No statistically significant preference for less routine (more enlarged) jobs was shown either with or without increased pay. There was a remarkably even belance between the preferred and abandoned jobs in terms of physical effort required.

Concluded that pay increases are important to nonsupervisor workers even at small differentials and that pay was more import than differences in job enrichment. Some workers may have preferred the enriched jobs, some were indifferent, and some preferred the less enriched job.

Singer, J. L. Daydreaming and the stream of thought. American Scientist, 1974, 62, 417-425.

Review of research findings on daydreaming. Three patterns of daydreaming have been delineated by factor analysis. These are [1] a tendency to mind wandering, fearful and fleeting daydreaming (2) tendency to daydream built upon strong unpleasant emotion and fear of failure [3] tendency to engage in positive daydreams used for future planning.

Concludes from research on effects of daydreaming on task per-formance that daydreaming and mind wandering helps to maintain a degree of varied stimulation and arousal and improved performance Signal detection studies indicated the persistence of stimulus-independent thought even in complex tasks.

Sipowicz, R.R., Ware, J.R. & Baker, R.A. The effects of re-ward and knowledge of results on the performance of a simple vigilance task. Journal of Experimental Psychology, 1962,

Four groups of Sm (20 to a group) monitored speriodic and brief interruptions of a continuous light source under isolated conditions for a 3-hr. period. The Sm in Group R were given \$3.00 if they detected all signals presented during the watch session, but lost .05, .15, .35, .75, 1.55, or all if they misses one, two, three, four, five, or six signals. Group KR was informed of all signals missed by a bright flash of light. Group R + KR received both KR and reward according to the schedule for Group R. Group C, a control, received neither reward nor KR.

Although all experimental groups were started.

reward nor KR.

Although all experimental groups were significantly better than the control group, the combination of reward and KR produced the highest level of signal detection. The results are interpreted as indicating that either reward or KR can be effective in maintaining a high level of vigilance. The effectiveness of reward, however, is highly dependent upon the manner in which it is used. The effectiveness of such interest in the second of the second control of the second of the

Sirota, D. Job enrichment - another management fad. The Conference Board Record, 1973, 10, 40-45. (a)

Discusses what job enrichment does and does not do and concludes that application is encouraging. Warns against over generalization of technique to situations in which job enrichment does not apply.

Sirota, D. Job enrichment - is it for real? Advancement Management Journal, 1973, 40, 22-27. (b)

Article discusses job enrichment in relation to redesign of blue and white collar jobs. The approach is only beneficial if it is applied to the problem it was designed to solve. In reaching this conclusion, two examples are cited.

Sirota, D., & Wolfson, A.D. Job enrichment: Surmounting the obstacles. Personnel, 1972, 49 (4), 8-19. (a)

Provided procedures for the adoption of job enrichment-over-coming the obstacles mentioned in another article.

1) Diagnosis

Supply guidance to managers
Use multiple resources
Recognize limitations
Do not force job enrichment on line management

6) Search for sympathetic top management 7) Emphasize flexibility 8) Use internal resources 9) Collect evidence & disseminate

Sirote, D., & Wolfson, A.D. Job unrichmunt: What are the obstacles? Personnel, 1972, 49 (3), 8-17. (b)

Discusses 11 reasons for job enrichment not bein; adopted.

Ideological

Organizational Managerial Technological

The employee

Diagnosis
"Prove it here

"Nothing new here"

Sjöberg, H. Relations between different arousal levels, induced by graded physical work, and psychological efficiency. Report Psychological Laboratory, University of Stockholm, 1968, No. 251.

Examined the hypothesis concerning an inverted-U relationship between the level of arousel and performance level by comparing the performance of 25 Ss in a choice-reaction task at five different arousel levels. Different work loads on a bicycle ergometer were used to vary arousal level. Heart rate was used as the criterion of arousal. The results were in full agreement with the hypothesis, performance being sost efficient at medium arousal level and successively less efficient with both increasing and decreasing arousal.

Skole, R. Brave new world at Volvo. Master in Business Administration. 1975, 9, 39-42.

Description of Volvo's Kalmar auto assembly plant in which teams of workers are responsible for the complete installation of one system and which uses a stack system to allow workers to control their own pace. Describes other features in this move toward industrial democracy including worker responsibilities in corporate boards, union management relationships, broker investment cost of the new plant, and reduced absenteeism and turnover. The plant has a computer controlled car carrier system.

Slocum, J.W., Chase, R.B., & Kuhn, D. A comparative analysis of job satisfaction and job performance for high and low skilled operatives. Experimental Publication System, 1970, Issue No. 5, Ms. No. 161A.

A total of 204 employees were sampled and completed the Porter need satisfaction questionnaire. The study collected data concerning the perceived need deficiencies of employees. The results indicate that dissimilarities exist between Porter's need model for managers and the operatives included in the sample. The findings from date on security and self-actualization needs are different from findings reported by other researchers. Authors conclude that more research is needed from larger groups of employees before generalizations can be made.

Slocum, J.W., Miller, J.D., & Misshank, M.J. Needs, environmental work satisfaction and job performance. Training & Development Journal, 1970, 24, 12-15.

Investigated the relationship between personality traits of lat-line supervisor's managerial role performance and satisfaction with various environmental work factors. So were 62 male members of lat-line supervision in a steel fabricating plant. Managers were asked to rank their foreman with respect to quality and quantity. Five environmental factors were measured by the questionnairs. The EPPS was administered. No appreciable differences in personality traits were found. Results indicate that in 4 of 5 areas high producing foremen perceive greater satisfaction.

Smith, M.C. An indirect measure of predicting speed performance for industrial operators. <u>Perceptual and Motor Skills</u>, 1974, 39, 677-678.

Two experiments are described, one in an electronics firm and another in the laboratory. Ss were given a task and asked how long they thought it would take them, timed at the task, and asked how long they thought they had taken. The task in each experiment was repeated at least five times. A strong relationship was found between the average of the estimated times at the end of the task and subsequent speed performance on the two different sorts of criteria used (rs=.91; rating: .54, writing).

Smith, P. C. The curve of output as a criterion of boredom. The Journal of Applied Psychology, 1953, 37, 69-74.

16 women operators of a power sewing machine paid by piece rate, were observed for one week to invostigate the relation—ship between the experience of boredom and changes in rate of output or shape of production curves for industrial workers.

Results showed a clear difference from those of the British Industrial Fatigue Research Board. Boredom is not necessarily accompanied by a depression in the curve of output, or vice versa.

Smith, P.C. Individual differences in susceptibility to industrial monotony. Journal of Applied Psychology, 1955, 39, 322-329.

Compared responses to questions concerning feelings of monotomy and horedom on the job of a group of 72 women knitwear mill operators, with answers to other questions designed to test hypotheses derived primarily from accounts of previous writers concerning the personal characteristics associated with susceptibility to monotony. Four hypotheses were not supported in this study: that the susceptible worker is more ambitious, tends not to daydream, is extrawreted, and is more intelligent. Three remained tenable: that the susceptible worker is likely to be young, restless in his daily habits and leisure-time activities, and less satisfied with personal, home, and plant situations in aspects not directly concerned with uniformity or repetitiveness.

On the basis of this and confirming evidence, and eighth hypothesis was considered tenable: that feelings of monotony are not merely a function of the task performed, but are related to more general factors in the individual worker. It was suggested that satisfaction with repetitive work does not necessarily reflect insensitivity and stupidity, as the more romantic textbooks seem to imply.

Apparently, some workers do not report monotony even in the face of a job with an extremely short work cycle.

Smith, P. C., & Kendall, L. M. Retranslation of expectations: An approach to the construction of unambiguous anchors for rating scales. <u>Journal of Applied Psychology</u>, 1963, 47, 149-155.

A procedure was tested for the construction of evaluative rating scales anchored by examples of expected behavior. Expectations, based on having observed similar behavior, were used to permit rating in a variety of situations without sacrifice of specificity. Examples, submitted by head nurses as illustrations of nurses' behavior related to a given dimension were retained only if reallocated to that dimension by other head nurses, and were then scaled as to desirability. Agreement for a number of examples was high, and scale reliabilities ranged above .97. Similar content validity should be obtained in other rating situations.

Smith, P.C., Kendall, L.M., & Hulin, C.L. The measurement of satisfaction in work and retirement. Chicago: Rand McNally, 1969.

Summarizes the Cornell Studies of satisfaction which represents a definitive research program of job satisfaction and employee attitudes. The aim of the study was to develop, validate and develop norms for a specific measure of job satisfaction, the Job Bescription Index (JDI). The final form of the JDI groups 72 items under the following five factors: (1) pay (2) promotion (3) work itself (4) supervision and (5) co-workers. Validation studies indicated that the JDI scales correlated with other measures of satisfaction. A multi-trait, multi-method approach demonstrated convergent and discriminate validity for the five scales. Factor analysis of the items show the distinction of the five factors. Normative information is based on a large carefully chosen group representing 21,041 U.S. firms.

Smith, P.C., & Lem, C. Positive aspects of motivation in repetitive work: Effects of lot size upon spacing of voluntary rest periods. Journal of Applied Psychology, 1955, 39, 330-333.

Investigated effects of lot size upon voluntary work rest stops. fample involved 5 female filing operators and 4 straddle milling operators. Workers were observed under three conditions, large, medium and small lot sizes. Results indicated that the most frequent work stops occurred for large lots; the least frequent for small lots. Results raise possibility that the pull to complete a batch of work is pleasant only when it is relatively mild and irritating when it is comparatively strong. Results add support to concept of a need for task completion.

Others have pointed out that repetitive work can often have positively motivating characteristics (traction) which tend to "pull the worker along" and are pleasant. Thus the assumption of repetitiveness leading to monotony could be questioned on two grounds-effects of individual differences and positive motivational characteristics of repetition.

Smoll, F. L. Communications - A rhythmic ability analysis system.

The Research Quarterly, 1973, 44, 232-236.

Report which describes a rhythmic ability analysis system that enables assessment of space-time characteristics of motor responses to auditory rhythmic stimuli. The system consists of an electronic motronome, a target and a series of electrical mechanical components that transmit anterior-posterior movements of the arm to a recording instrument.

Smoll, F. L. Preferred tempo in performance of repetitive movements. <u>Perceptual and Motor Skills</u>, 1975, 40, 439-442. (a)

Within and between S variability in performance of repetitive movements at a self-paced tempo was studied. Male and female Ss (Ns = 75) performed 36 consecutive arm swines at an individually chosen tempo. Differences between Ss selected tempos of performance were considerably greater than the amount of vs. ation in Ss motor response times, indicating that individuals have preferred tempos of voluntary movement which differ from those of other individuals. No sex differences were evidenced in either preferred tempo or consistency of performance.

Smoll, F. L. Preferred tempo of motor performance: Individual differences in within-individual variability. <u>Journal of Motor Behavior</u>, 1975, <u>7</u>, 259-263. (b)

henavjor, 1979, J. 259-261. (b)

The magnitude of individual differences in within-subject variability in performance of repetitive movements at a self-paced tempo was investigated. Subjects (N = 150) performed an accuracy task involving consecutive arm swings at an individually chosen tempo. Odd-even and serial half reliability coefficients for within-subject variances (r = .72, .66) were significant at the .01 level. Also, statistically significant correlation coefficients ranging from .70 to .76 were found between subjects' mean response times and within-subject variances. With the effect of mean response times partialled out, the reliability coefficients for within-subject variances were reduced (r = 41, .30) but were still statistically significant (p < .01). The findings indicated that individual differences in within-subject variance were present to a moderate degree.

Subjects performing at faster preferred tempos (lower mean response times) were more consistent from response to response (lower within-subject variances) than were those subjects performing at slower tempos. Thus, an individual's preferred tempo was a factor of consequence affecting the relative consistency or inconsistency of his performance of repetitive movements. Similarly, other investigators have reported that faster preferred tempo and greater consistency tended to go together for performance of various kinds of perceptual, cognitive, and motor tasks.

The evidence indicates that within-subject variance in performance of repetitive movements at a self-paced tempo is not an entirely random variable; but rather, in conformance with the theory of biological variation in human motor behavior, this measure is probably a reflection of biological variability unique to each individual. Therefore, within-subject variance indicates that status of the Individual from time to time and, as such, is valuable in describing performance at a self-paced tempo.

Although relatively little is known about preferred tempo, this phenomenon is regarded as a potentially influential factor affecting performance on a variety of tasks involving repetitive motor responses to externally imposed rhythmic stimuli. As previously noted, measures of motor response consistency provide information about a characteristic of performance which is not disclosed by traditional measures, such as mean algebraic or absolute error: and studies have shown that there are moderate to high reliable individual differences in intra-individual variation. However, use of this measure is frequently neglected. The findings of the present study indicate that in order to fully elucidate factors surrounding individual differences in preferred tempo and its role in motor behavior, further investigation should appropriately include snalysis of within-subject variance as well as mean response times.

Sofer, C. Hen in mid-career: A study of British managers and technical specialists. New York: Cambridge, 1970.

Central theme of book is review of factors governing commitment to work and ways in which work in a large organization influences the individual's conception of himself. Samples from which data were drawn included executives from two major English manufactures - a chemical firm and a U.S. controlled automobile manufacturer. Sample characteristics were as follows: Total N=81 males, 12,000-20,000 income range. 3 age groups young (29-34), middle (35-44), old (45 6 older). Data were collected from company records, interviews and informational data sheets. Most of the book centers on interview material with limited statistical treatment of data.

Book covers topics of selection, advancement, personality of managers, attitudes of managers to employers, personal needs, and managers at pre-retirement stage.

The major theme is the importance of work functions for psychological and social survival. Stresses that many of the "ego" demands must be satisfied in the work situation. Family and social participation cannot match the satisfaction evailable in successful job performance.

Sokal, R.R. Classification: Purposes, principles, progress, prospects. Science, 1974, 185, 1115-1123.

There is an intimate interrelation between principles and procedures in classification, and modern work in this field has been profoundly affected by the development of electronic computers. Besides the delineation of natural systems and the achievement of economy of memory and ease of manipulation, the primary purpose of classification is the description of the structure and relationship of groups of similar objects. Successful classifications generate scientific hypotheses, although much classificatory work has applied, practical goals. The acceptance of polythetic taxa is a major conceptual advance and has directly led to classifications based on many, equally weighted characteristics. The specification of data for classification by computer will enhance objectively but not eliminate cultural and subjective biases. Techniques of classification include cluster snalysis and ordination, and numerous ways of representing classifications have been elaborated recently. By the application of graph theory to some classificatory problems it has been possible to reconstruct evolutionary branching sequences. Computer classification has been successfully applied across a broad range of disciplines.

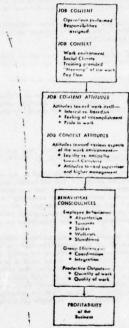
Sorcher, M. Motivation on the assembly line. <u>Personnel Administration</u>, 1969, <u>12</u>, 40-48.

Attempted to test previous findings concerning (a) a S's understanding of his role in the business, and (b) the opportunity to participate in group decisions. 9 male and 6 female employees (Group 1) and 125 female employees (Group 2) served as Ss. The redesign of the job environment for both groups is described. Mean average performance over a 10-wk period before the program implementation was compared with the mean performance for 10-wk following the redesign. Five factors were measured; absenteeism; tardiness; quality; efficiency; and actual dollar savings. Results suggest "better job understanding followed by a commitment to a self-established goal does appear to motivate individuals to improve their performance."

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Sorcher, M., & Meyer, II. H. Motivation and job performance. Personnel Administration, 1968, 31, 9-21.

Presents a research model for study of job design which is diagrammed below: RESEARCH MODEL FOR SHUPY OF JOB DESIGN



Reports results of exploratory studies of eight related job variables. Workers whose jobs were higher in responsibility had more favorable attitudes. Second shift workers did not differ from first shift workers in attitude or motivation when amt of job responsibility was equated. A comparison of groups similar in every way except the repetitiveness of their tasks showed that overall productive motivation was lower in 3 out of 5 depts. for workers engaged in very repetitive work. Higher motivation was associated with regular job rotation but no rotation was better than occasional rotation. The poorest motivation was found with causal rotation. Where physical activity was possible on the job motivation was higher. Results on effects of social isolation or opportunities for interaction were conflicting.

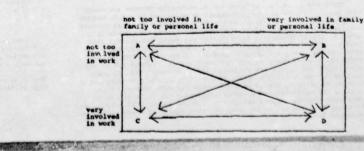
In a study of two depts, differing in the amt of job variety and responsibility (Dept A - high variety, etc. Dept B - low variety, etc.) it was found that role training which consisted of meetings with foremen, goal settings, group discussion and training in job understanding resulted in overall improved motivation in both pept A & B. Quality improved in Dept B and there was a speed up of cycle time in Dept B.

Concluded that increasing employee involvement in work by the use of goals, the provision of more than minimum training for assembly-line workers and encouraging employee participation in goal setting can improve productive motivation.

Spink, P. Some comments on the quality of working life. <u>Journal of Occupational Psychology</u>, 1975, 18, 179-184.

Starting from z view of the present, in which there is growing awareness of the socio-technical nature of work systems, the paper stresses the need to explore other levels of system in order to add to existing pictures of the world of work. Three aspects are considered: the interdependence between work and non-work, the entering and leaving process with its attendant transitional systems, and the wider societal and global reassessments of values and relationship. It is suggested that awareness of these and other aspects will lead to different concepts of work.

A diagram of the interdependence of work and non-work is presented below:



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Abstracts (Cont'd.)

Srivastva, S., Salipante, P.F., Jr., Cummings, T.G., Notz, W.W., Bigelow, J.D., Ewaters, J.A. <u>Job satisfaction and productivity</u>. Cleveland, Ohio: Department of Organizational Behavior. Case Western Reserve University, 1975.

Reports a study that involves a review of research done over the last IS years on organizational factors which affect job satisfaction and productivity. The study focused on three questions

- The identification of action lever variables which can be manipulated to create desireable changes in satisfaction and productivity
- (2) Knowledge of those factors (individual and organizational) upon which desireable results are contingent
- (3) General understanding of change processes

The book contains a bibliography of 600 empirical studies included in the review. The studies are divided into correlational and field studies. Attempts are made to quantify the literature review.

Stagner, R. Boredom on the assembly line: Age and personality variables. <u>Industrial Gerontology</u>, 1975, 2, 23-44.

Review of literature on the relationship of aging and personality variables to assembly-line work and job satisfaction. Data indicates that blue collar workers show increasing job satisfaction with age but there are fewer older workers among assembly line operatives due to seniority job change and early retirement. Research indicates that some personality patterns and physiological patterns are associated with more efficient work by older employees on paced tasks.

Young workers with strong autonomic nervous system arousal to boredom and slow decrement of the autonomic nervous system reflexes under constraint are the group most likely to rebel against mechanically paced production. Conversely, those with a predisposition to EEG activation and restricted theta activity may adapt best. Anxious or autonomically labile individuals will find assembly line work frustrating. Persons with high ego strongth will cope most successfully with paced operations. Persons high on sensation-seeking will do poorly on the line. Persons high on authoritarianism will adapt well to line jobs.

Standing, T.E. An application of information theory to individual worker differences in satisfaction with work itself. Unpublished doctoral dissertation, Ecwling Green State University, 1971.

Study of 63 inspectors in steel mill using a measure of cogmitive complexity [Noie Construct Repertory Test], job description
index, and reaction to your job questionnaire. Found a curvilinear
shape relationship between cognitive complexity and satisfaction.
Inspectors whose cognitive structures were complex or simple were
less satisfied with the work itself than inspectors who were moderately complex. Cognitive complexity was also significantly related to
four other aspects of satisfaction: promotion; supervision; amount
of say in how job is done and feedback from the job. Bigh cognitive
complexity inspectors were less satisfied with those 4 aspects. This
dissatisfaction was interpreted as a function of simplifying constraints placed upon an inspector's job behavior.

Standing, T.E. Satisfaction with the work itself as a function of cognitive complexity. <u>Proceedings of the Bist Annual Convention</u> <u>American Psychological Association</u>, 1973, <u>2</u>, 603-604.

Tested hypotheses that satisfaction with work itself is an inverted U shaped function of cognitive complexity. Sample of 61 male steel mill inspectors completed JDI, Reactions to your job, Kelly's role construct repertory test (measured complexity of individuals work related cognitive structure). Cognitive complexity scores were derived by principal components analyses.

Four of 14 satisfaction scales did not follow a linear relationship. These were JDI work scale, JDI pay, JDI promotion and reactions to your job (job is not wasteful of time and effort).

An inverted U shaped curve was most accurate description of relationship between cognitive complexity and satisfaction with work itself.

Steers, S.M. Task goal attributes, n achievement, and supervisory performance. Technical Report No. 30, September 1974, Contract Non: B00014-69-k-0200-9001-NR 151-315, University of California, Office of Haval Research.

This investigation analyzes the relationship between employees' task goals and supervisory performance as moderated by n Achievement among a sample of first-level supervisors working under a formalized goal-setting program. Before need strength levels were taken into account, little consistent relationship was found between the five task goal attributes and performance. After dividing the subjects into high and low n Ach groups, however, it was found that performance was significantly related to increases in feedback and in goal specificity for high n Ach subjects, and to participation in goal-setting for low n Ach subjects. Goal difficulty and peer competition were found to be unrelated to performance for both groups. These results are then compared to other studies on the topic and it is concluded that individual difference factors, like n Achievement, must be taken into account in any comprehensive theory of goal-setting in organizations.

Steiner, I.D. <u>Group process and productivity</u>. New York: Academic Press, 1972.

The book reviews laboratory experiments using small groups. Problem arises when results are generalized to a natural setting. Prosents three determinants of productivity: 1) task demands 2) resources and 3) process. Describes a typology of tasks demands and research findings in this area. Reviews four types of tasks: 1) disjunction, 2) conjunctive, 3) additive, and 4) discretionary.

Stewart, C.P. Motivating the employee. Studies in Personnel Psychology, 1970, 2, 89-93.

Summarizes the work being done by R. Ford of the American Telephone and Telegraph Company to reduce employee dissatisfaction, turnover, grievances, and loss of productivity. Ford's approach was based on Herzberg's job satisfaction theory. Seven ways of improving the job of women who answer complaint letters and telephone calls were introduced at a rate of 1/wk to an experimental group whose turnover, productivity, promotions, and attitudes were compared with a control group. The experimental group showed significant improvement over 6 mos., thus supporting the "job improvement" approach to employee motivation.

Stone, E.F. Job scope, job satisfaction and the protestant ethic: A study of enlisted men in the U.S. Navy, <u>Journal of Vocational Behavior</u>, 1975, 7, 215-234.

Ouestionnaire data were obtained from 149 enlisted men in the U.S. Navy. The job scope [JS]-satisfaction with the work itself (SWI) relationship was examined for the study's total sample and for subsamples created by grouping individuals on the basis of their degree of belief in the Protestant Ethic (PE). It was hypothesized and found that the JS-SWI relationship was positive and significantly different from zero for the study's total sample and each of the three PE subsamples. Contrary to one of the study's hypotheses, PE did not moderate the JS-SWI relationship. The study's results were discussed in terms of their implications for theory and practice in the area job design. The alienation hypothesis of Hulin and Blood was not supported.

Stone, E. F., & Porter, L. W. Job scope and job satisfaction; A study of urban workers. Technical Report 22, Nov., 1973, University of California, Contract Honr N00014-69-A-0200-9001-NR 151-315, Office of Naval Research.

The relationship between job scope and job satisfaction was examined for a sample of urban, predominantly blue-collar, employees. Incumbents in sixteen jobs provided data on job characteristics (N = 164) and job satisfaction (N = 593). Rank-order correlation coefficients were computed between mean job scope indices (e.g., variety, autonomy, etc.) were positively related to satisfaction with the "work itself." Implications of these findings for the Hulin and Blood (1968) model relating job level, job satisfaction, and allenation from middle-class work norms and values were discussed. Morker on jobs of larger scope did not experience greater dissatisfaction with work which does not support Hulin and Blood. Negative r's were found between job scope and pay and promotion.

Stone, E.F., & Porter, L.W. Job characteristics and job attitudes: A multivariate study. <u>Journal of Applied Psychology</u>, 1975, 60. 57-64.

Attitude data were obtained from 556 employees in a western telephone company. Respondents held one of 16 "craft" jobs in the department selected for study. Multiple discriminant function analysis was performed using 16 groups formed on the basis of subjects' job titles. Variables used in this primary analysis included job satisfaction, organizational commitment, motivational force, and sources of organizational attachment. Discriminatory power for the 16 group solution was .53. A secondary analysis was performed in which discriminant function means were related to means of jobs on several job characteristics variables. These two analyses, viewed jointly, suggest that the relatively high discriminantry power achieved in the primary analysis may have been a function of job scope-job attitude relationships demonstrated in the secondary analysis.

Strang, H.R. Task definition and immediate knowledge of results in monitoring performance. <u>Perceptual and Motor Skills</u>, 1972, 34.

Examined the influences of task definition (test or parciae) and immediate knowledge of results on visual monitoring with 168 university students. A 2 x 2 x 2 analysis of variance showed that the only significant effect was a deterioration in recognition over time (p  $\langle$ , 01). An <u>a posteriori</u> analysis, however, indicated that test definition coupled with immediate knowledge depressed high performance (p  $\langle$  .05).

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Survey Research Center, <u>Survey of Working Conditions</u>. Final Report, August, 1971. University of Michigan. U.S. Department of Labor Employment, Stock Number 2916-0001.

Assesses the frequency and severity of labor standards problems and indicates that major demographic or occupational subgroups most affected by these problems. Determines the most important problems confronting workers. Develops job satisfaction measures and a measure of mental health. Assesses the impact of working conditions upon the well-being of workers as indicated by their job satisfaction and mental health. Establishes besseline statistics for subsequent surveys on these measures, and establishes normative statistics for further data collection.

Susman, G.I. The concept of status congruence as a basis to predict task allocations in autonomous work groups. Administrative Science Quarterly, 1970, 15, 164-175. (a)

Field study investigation of work groups in an oil refinery whose members are allowed to make their own decisions about task allocation. The concept of status congruence is utilized to predict that tasks will be assigned on the hasis of the consistency between valued task and valued member attributes. The data support the hypothesis for one job classification, but are consistently in the opposite direction of predictions for another. Supplementary field data indicated that the value of job and task attributes varied with rank of formal job classification. Implications of the findings for increased understanding of autonomous group functioning are discussed.

Susman, G.I. The impact of automation on work groups autonomy and task specialization. Human Relations, 1970, 23, 567-577. (b)

Sampled 13 three-man work crews of an oil refinery using interviews and field observations. Work crews included workers at two skill levels: high-skilled and low-skilled. Results indicated that in a highly automated industrial setting, work groups operating in an "uncertain" environment and not required to adhere to exact job descriptions tend to form in a conditionally autonomous way, with each member becoming competently multiskilled. Those in high-skilled position tend to identify more with managerial objectives than those in less-skilled position.

Susman, G.I. Process design automation and worker alienation. Industrial Pelations, 1972, 2, 34-45. (a)

Field observation study of 26 plants engaged in 106 continuous process jobs. Jobs were classified by type of control (automatic or manual), type of process (batch or non-batch) and by industry (chemical petroleum refining, electrical power, beverages, gypsum, glass and cement). Researchers rated jobs on three indices of alienation (power, meaning and norms).

Major results indicated that the following contributed to mwaninglessness of a job: (1) automatic control in batch production jobs (2) manually controlled, non-batch process jobs. Results suggest that automation and non-batch process reduce meaning by eliminating direct worker intervention in the workflow process. Second result was that automation contributed to the development of a status gradient consisting in differences in pay, training, and mastery of the job. Power, as measured by the discretion and decisions a worker could make, was reduced by automation in non-batch production jobs, but increased in manual non-batch jobs. Automation decreased variety in non-batch production jobs.

In general except for status gradients, automation does not reduce alienation. In continuous process jobs, other characteristics of automated factories probably have as great an influence on worker slienation than technology itself.

Susman, G.I. Workers' responses to job enlargement by location of childhood and current residence, unpublished. Available from Gerald I. Susman, Associate Professor, College of Business Administration, Pennsylvania State University, 120 Bouche Building, University Park, Pennsylvania 16802, 1972. (b)

Criticizes studies which test for differential responses to job enlargement among rural and urban workers for not controlling for industry and technology differences among the jobs studied, defining rural and urban populations by plant location only, and measuring attitudes not appropriate for testing the efforts of job enlargement. These criticisms are eliminated in the present study by testing the job enlargement hypothesis within continuous process industries only (127 jobs in 26 plants rated by industrial engineers within the companies), with populations defined by child-hood residence and plant location and by measuring attitudes related to intrinsic work motivation (329 employees of the companies completed a questionneire, 55 percent response rate). It was found that populations of rural bred-urban resident, rural bred-urban resident, and urban bred-urban resident all responded favorably to job enlargement and discretion, in pride of accomplishment, and interest in job.

Susman, G.I. Job enlargement: Effects of culture on worker responses. Industrial Pelations, 1973, 12, 1-15.

Collected data from 26 industries, 11 rural plants and 15 urban plants, using questionnaires. The results do not confirm the hypothesis that rural employees react favorably while urban employees react unfavorably to job enlargement. The results indicate that present residence has a stronger influence on job enlargement than does childhood residence. People of different cultures and backgrounds react differently to job enlargement, but the differences cannot be attributed solely to urban or rural residence.

Svetlik, B., Prien, E., & Barrett, G.V., Relationships between job difficulty, employees attitude toward his job, and supervisory ratings of the employee effectiveness. Journal of Applied Psychology, 1964, 48, 320-324.

Using correlational techniques, an investigation was made of the relationships between job difficulty (estimated by job evaluation factors), employee attitudes toward his job, (N=110 nonunion employees) and job environment, and supervisory ratings (N=130 supervisors) of employee performance. As job difficulty increased, employee attitudes were significantly more positive toward the job, management, and communication, and opportunity for advancement. Partial correlations showed that the relationship between job satisfaction and job difficulty increased when the effects of general morale were elignificantly rated (negatively) to amployee salary and job tenure. Correlations between employee's attitude dimensions indicate increasing complexity of job content and increased content with poople as part of the job, are positively related to an employee's attitude toward his job.

Swain, A. D. Design of industrial jobs a worker can and will do. <u>Human Factors</u>, 1973, <u>15</u>, 129-136.

Ergonomists working in the military area need to modify some of their assumptions about operator (or worker) behavior when they transfer to work in the industrial area. The goal of the ergonomist in the latter area should not be job simplification as it often is in the former area. Job simplification is a frequent outcome of human factors approaches which consider only what a man can do. In the industrial setting, cost-effective attainment of long-range industrial system efficiency and effectiveness cannot be achieved unless consideration is also given to what a man will do. This paper describes some of the factors important to the ergonomist in industrial work and suggests that their consideration is especially important if the ergonomist is to consider himself as a systems designer rather than a "knobs and dials" man.

Tangerman, E.J. Every man his own inspector, every foreman his own boss at Graflex, American Machinist, 1953, 2, 3.

Report on Graflex Incorporated, Rochester, New York which makes precision cameras. The company operates two plants and is characterized by small lot production, inspection by operators rather than inspectors, full freedom of action by foreman, excellent work methods, tool control, production engineering and plant house keeping.

Taveggia, T.C., & Hedley, R.A. Work discretion and work satisfaction. A study of British factory workers. Technical Report No. 25, Contract Nonr N00014-69-A-0200-9001 NR 151-351, April 1974, University of California, Office of Naval Research.

Presents and discusses a portion of empirical data collected from a large sample of British factory workers (N=5,274) and relates these workers' perception of the discretion available to them of their work satisfaction. Perceived discretion is measured for two sectors of work experience: first, discretion surrounding actual job performance; and second, discretion involving participation in the world of work. The major conclusion suggested by the evidence presented is that job performance discretion is less significantly related to work satisfaction than workers' perceived discretion as to where and at what job they work. There was substantial variation is workers' perception of job and work discretion.

Taveggia, T.C., & Hedley, R.A. Job specialization, work values, and worker dissatisfaction. Technical Report No. 29, January, 1975, University of California, Contract Nonr N00014-69-A-0200-9001-NR 151-315, Office of Naval Research.

The recent work literature includes three contradictory propositions relating job specialization and worker dissatisfaction. The first predicts an unconditional relationship between these variables; the second predicts that it will be higher among workers committed to middle-class work values; the third predicts that it will be higher among "alienated workers. This paper reports data from 3,193 British industrial workers which suggest that, when individually measured and anlyzed, job characteristics relate in different ways and in varying degrees to worker dissatisfaction. The implication for the above propositions is that they may be complementary rather than competing; the validity of each may depend on the specific correlate or correlates of specialization upon which attention is found.

Taylor, F. W. The principles of scientific management. New York: Harper & Row, 1911.

Presents principles of scientific management which Presents principles of scientific management which involves four management responsibilities: (1) develop a science for mach element of a man's work which replaces the old rule of thumb method, (2) scientifically select and train the worker in this method, (3) cooperate with worker to insure work is completed in prescribed manner, and (4) equal division of work and responsibility between management and the worker.

The steps to be followed in developing the work method are as follows: (1) Find, say, ten or fifteen different men (preferably in as many separate establishments and different parts of the country) who are especially skillful in doing the particular work to be analyzed. (2) Study the exact series of elementary operations or motions which each of these men uses in doing the work which is being investigated, as well as the implements each man uses. (3) Study with a stop watch the time required to make each of these elementary movements and then select the quickest way of doing each element of the work. (4) Eliminate all false movements, slow movements, and useless movements. (5) After doing away with all unnecessary movements, collect into one series the quickest and best movements as well as the best implements.

Taylor, J.C. Some effects of technology in organizational change.

<u>Human Pelations</u>, 1971, 24, 105-123. (a)

Tested the effects of sophisticated technology or automation on job-related behaviors in work groups. Three hypotheses were studied: (1) Sophisticated technology is associated with more autonoscous and participative group process. (2) Sophisticated technology facilitates planned change efforts directed toward increasing participative group process. (3) When change is facilitated by technology, the change toward participative group process will be more permanent than when it is not. The sample included over 1,000 persons is 140 non-supervisory work groups employed by a refinery company. The results supported the hypotheses.

Taylor, J.C. <u>Technology and planned organizational change</u>. Ann Arbor, Michigan: Institute for Social Research, University of Michigan, 1971. (b)

Gives results of paper-and pencil questionnaires administered to non-supervisory members of some 300 work groups in an oil refinery and an insurance firm. (Total N=3,800). In neither company was education, tenure, or urban vs. rural background found to be related to supervisory or peer leadership, or to group process. In the refinery, level of technological sophistication was found to be directly related to the pre-change level of supervisory and peer leadership and to group process, whereas the insurance company showed the inversal and to group process, whereas the insurance company showed the inversal form a successful attempt to increase peer leadership and group process in the refinery, groups with more technological sophistication showed more increase than groups with less. The change attempt was unsuccessful in the insurance company.

Taylor, J.C., Landy, J., Levine, M., & Kamath D. The quality of sorking life; An annatated bibliography. Los Angeles, Center for Organizational Studies, Graduate School of Management, University of California, 1972.

This annotated bibliography attempts to classify all empirical research from 1957 to 1972 that deals with the quality of working life as a phenomenological experience of people at work.

The bibliography has been designed to provide a basis for evaluation, planning, research and change development from which researchers and professionals can formulate a coherent body of theory and practice for creating conditions for humans working life. It has also been designed to accumulate experience to date and make it available to managers, union leaders and government officers who are preparing to review or evaluate the literature in this area as a prejude to formulating policy and action.

Taylor, L.K. Not for bread alone: An appreciation of job enrich-ment, London: Business Books Limited, 1972.

Non-academic book on successful job enrichment programs in United Kingdom and Europe. Book contains 9 case studies including:

- 1. Richard Baxendale & Sons Limited
- 1. Richard Baxendale & Sons Limited
  2. Dexion-Comino International Limited
  3. Shell UK Limited: Stanlow Refinery
  4. Mercury House Group
  5. Carrington & Devhuret Group: William Tatton 6

- Co. Limited Electricity Board Swedish State Power Board
- Volkswagen AG The Volvo Group

and brief examples from:

Jensen Motor Company, UR Watford Launderers and Clearners Hills of Fife Unit Dry Cleaning Shops Bowthorpe Holdings Limited Group of Companies: Hellermann Deutsch

The book attempts to bridge the gap between scademis and pers, research and application, theory and practice.

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Teichner, W.H., & Olson, D.E. A preliminary theory of the effects of task and environmental factors on human performance. Human Factors, 1971, 13, 295-344.

Developed a systematic approach to the prediction of human per-formance as a function of task variables and environmental factors. The approach uses the basic literature of experimental psychology and of physiology in a context in which postulates and assumptions about underlying processes and empirical relationships are made as specific as possible. This paper is a presentation of the postulates, assumptions, and models for handling them. Its aim is toward organ-ization and fessibility rather than toward a final theory of human

Theologus, G.C., & Fleishman, E.A. Development of a taxonomy of human performance: Validation study of ability scales for classifying human tasks. Catalog of Selected Documents in Psychology, 1973, 1.

Presents preliminary entimates of the construct and predictive validity of the Task Assessment Scales (TAS) that consists of a set of 35 scales representing different human ability requirements to be used in the analysis of performance on various tasks. The TAS represents one system for describing and classifying tasks in order to improve the generalizations of remeatch results about human performance. A panel of nine judges used the TAS to rate each of 36 tasks. These data were subjected to two separate analyses. First, coefficients of correlation and similarity were used to examine the relationship between selected ability scales and empirically derived ability factors which they were designed to represent. This analysis provided an estimate of the construct validity of the scales. Second, a multiple regression technique was used to determine the predictive relationship which existed between the judges' ability ratings of tasks and mean performance data on these tarks that was obtained from an earlier factor-analytic study utilizing the same tasks. In general, it was found that the ability scales possessed substantial construct and predictive validity. The task ratings on the eight scales which were assessed for construct validity were significantly correlated with the factor loadings for these same tasks on factors which corresponded to these scales. Further, a multiple regression equation was generated which indicated that a set of three ability scales were significantly related to (Re.64, p.,01) performance on the tasks which were rated. Although a final interpretation of these findings must await subsequent cross-validation efforts, it does appear that the TAS validity describe human tasks.

Theologus, G. C., Romanko, T., & Fleishman, E. A. Development of a taxonomy of human performance: A feasibility study of ability dimensions for classifying human tasks. JSAS <u>Catalog of Selected Documents in Psychology</u>, 1971, 2, 25.

A major problem which confronts the behavioral sciences is the lack of a unifying set of dimensions for describing human task performance. The absence of such a system limits the ability to relate human performance observed in one task to that observed in similar tasks. There is a need for a well-defined, task-descriptive language for use by those who must apply the results of research to operational tasks. This report describes one of several approaches under development as part of a larger program; the approach is concerned with developing a task classification system based upon known parameters of human performance. The human abilities on which this system was based were derived primarily from the reported factor analyses of human performance in the cognitive, psychomotor, physical, perceptual, and sensory areas. Definitions of the abilities were developed together with rating scales for each ability. A series of pilot studies were than undertaken with the objective of producing an instrument which would have high reliability in classifying human tasks. During these exploratory studies, the initial set of human abilities were arbified, the definitions of the abilities were revised, and the rating technique was improved. In addition, various methods of analyting the reliability data were examined and two methods of analyting the reliability data were examined and two actions of of anchoring the rating scales were compared. The results of this pilot research indicated that it was possible to develop a set of reliable, ability-based scales for classifying tasks, although more work will be needed. Future research on a human-ability approach to classification will continue with the investigation of the problems of scale reliability and will initiate research on questions of the validity of the classificatory instrument. A major problem which confronts the behavioral sciences is

Thompson, D.B. Enrichment in action convinces akeptics. <u>Industry Neek</u>, Feb. 14, 1971.

Reports on a job enrichment program initiated in 1971 at the Kaiser Aluminum Corporation in Ravenswood, West Virginia, with 60 maintenance workers in a reduction plant. Productivity was low and there were walkouts and slowdowns. Time clocks were removed and supervision was eliminated. Morkers decided what maintenance jobs were to be done and in what priority. Employees kept their own time cards. Results showed improved morale, pride in work, decreased tardiness, maintenance costs down 5.5% and maintenance work done with more "mailty." more "quality."

Tichy, B. M. & Sandstrom, T. Organizational innovations in Sweden. Columbia Journal of Morid Business, 1974, 9, (2), 18-27.

Description of Saab-Scania-Sodertalve engine assembly plant in which autonomous work groups assemble entire engines and Volvo Kalmar Factory for team assembly of automobiles.

Both innovations are described as "technostructural" in that technological and environmental conditions constrain and limit the organizational design and menagement structure but do not fully determine it. The final technostructural arrange should produce a desired effect on individual members. The following principles guided work restructuring in Sweden:

- Participation in decision making increases commitment and motivation to carry out the decisions.
- 2. People have complex sets of motivation for working.
- The core unit for improving employee satisfaction and performance is the work group not the manager or the individual worker.
- A sense of completeness and satisfaction with a task is enhanced when the individuals participate in a total task.
- Tasks should be organized to give teams maximum control over them.
- Physical architecture is important in affecting satisfaction and productivity.

Tinsley, H.E., & Woiss, D.J. A multitrait-multimethod comparison of job reinforcer ratings of supervisors and supervisees. <u>Journal of Vocational Behavior</u>, 1971, <u>1</u>, 287-299.

Comparison of responses of supervisors and workers on the Minnesota Job Description Questionnaire which was completed by 138 supervisors of nine jobs and 361 of their supervisees. The resulting Occupational Reinforcer Patterns (ORPs) were compared by correlational analysis of variance. ORPs from both groups had high split-group reliabilities. Strong support was obtained for the convergent and divergent validity of the civil engineer, elementary teacher, and radiologic technologist ORPs. Moderate support was demonstrated for the validity of the social caseworker, bank teller, sutomobile salesman, and salesman-driver ORPs, while the valier-weitress and truck driver ORPs were found to be of questionable validity. The data suggest that supervisors and supervisees generally perceive reinforcer characteristics similarly, although the two groups of raters tended to disagree on the extrinsic reinforcers and on the reinforcer characteristics of lower level occupations.

Travelers Insurance Co. <u>Job enrichment trial-data processing department analysis and results</u>. Final Report June 1971, Travelers Insurance Co.

Reports on controlled job enrichment program in data processing department of Travelers Insurance Co. One group of Keybunch operators (N=42) were quiven responsibility for work schedules, correcting coding and Keybunch errors anddealing directly with company employees who request keybunching. Another group in the main office (N-65) served as the control group and their jobs were not enriched. The program was evaluated at the end of a years trial. The results are reported

below.	Woodland Street (Experimental Group)	Data Center (Control Group)	Difference
Current Productivity	104.0%	94.0%	10.0%
Absenteeism Change	24.1%	(29.0%)	53.1%
Turnover Change	(6.4%)	5.1%	(11.5%)
Attitude Improvement	16.5%	.5%	16.0%
Throughput Change (cards per hour)	39.6%	8.1%	31.5%
Error Ratio Change	35.3%	.8%	34.5%

Trist, E.L., & Bamforth, K.M. Some nocial and psychological consequences of the Longwall method of coal-getting. <u>Human Relations</u>, 1951, 4, 3-38.

Describes hand got composite group method of coal-mining with mechanised long wall method. This contemporary methods of coal-getting has prevented establishment of sound personal relations among miners. A variety of defensed displayed by the workers is reviewed and the conclusion is that a more detailed study of the social structure of the mine will help reduce the need for these defenses. hese problems include uneven levels of functional efficiency between whifts, cycle stopponges, low productivity, isolation of some miners, competition and problems between workers scapegoating, and absenteeism. (See Trist, Biggin, Murrsy, & Pollock, 1961).

Trist, E.L., Higgin, G.W., Murray, H., & Pollock, A. B. Organizational choice. London: Tavistock Publications, 1963.

Between 1955 and 1958 the Tavistock Institute of Human Relations were able to carry further their coal-mining studies by making simultaneous studies, in a single locality, of a variety of systems, ranging from traditional unmechanized working, through conventional partly mechanized systems, to more highly mechanized emergent systems.

Each production unit was examined as a mocio-technical system.

The various forms of organization found in northwest Durham were analyzed in five aspects: the quality of the work roles the system gives rise to; the kinds of task group; the work culture: the nature of inter-group relations; and the managing system. For each pattern, long term (e.g. 15 months) observation of actual functioning led to comparison against a very interesting set of criteria.

The core study was of a 'conventional' mechanized long-wall face and of a strictly comparable face worked on a 'composite' system. In the composite unmechanized mining the face-worker is multi-skilled, working in a small, largely autonomous primary group, each man having a direct interest in the total task. The whole business of getting coal is complete in each mhift. In the conventional long-wall method where conveyors and coal-cutters are used, it takes three shifts to complete the total task. One shift undercuts and prepares the face, the next fills the lonwand coal onto the conveyor, the third advances the approach roads and packs the toof. The total cycle is thus cut across by shifts. In the composite mechanized method efforts were made to increase the group cohesion by goal setting group bonus incentives and interchanging jobs.

Differences in functioning were striking. Non-productive work caused by disorganization or hold-ups—'non-cycle activity'—amounted, in the conventional group, to 2% of time; in the composite group, incredibly, it was half of one percent. Variety of work experience was of course greater in the composite; on a verage, men gained experience on 3.6 tasks against the 1 of the conventional. 'Variety of work group experience' was five times as much in the composite as in the conventional. 'Absence' totalled 20% of possible shifts in the conventional, compared with 8.2% in the composite. The conventional was never shead of 'cycle timetable', and in 69% of cycles was behindhand, whereas composite was up to time—%able, or even in advance, in 95% of cycles. Productivity as output per man shift at the face was 3.5 tone for conventional, against 5.3 tone for composite.

Trunko, D.A. Individual and group correlates of attitudes toward work-related change. <u>Journal of Applied Psychology</u>, 1961, 45, 338-344.

This report presented some of the findings of a study of the correlates of employee attitudes toward change as a general iobrelated phenomenon. Questionnaire and personnel file data were 
obtained for 212 nonsupervisory and 46 supervisory personnel of 
a medium sized midwestern insurance company involved in office 
automation. Attitudes toward change were measured with a nineitem Change Scale included in the questionnaires. Evidence for 
the reliability and logical validity of the Scale were presented.

The results may be summarized as follows: (1) Female employees accres significantly lower on the Change Scale than males. However, since none of the other indices of job investment (age, length of service, and Job Involvement Index) was predictive of change attitudes, the sex difference was interpreted in terms of the differential importance assigned to various aspects of the job by men and women. Since women consistently rate social aspects of the job as relatively more important than domen, it was hypothesized that unfavorable attitudes toward change may reflect a perceived threat to informal social structure change poses a threat to the satisfaction of social needs through informal social structure. (2) Change Scale scores were positively related to Wonderlic Personnel Test scores, amount of education, and freedom from job anxiety, supporting the view that change attitudes are related to the capacity to adjust to changes. (3) Attitudes toward change were found to be associated with work group membership. Change Scale scores within groups being relatively more humspeneous than among groups. (4) Group cohesiveness was negatively related to Group Change scores. This finding gave support to the view that less favorable attitudes toward change may indicate that change poses a threat to the satisfaction of social needs through informal social structure. (5) Supervisors' attitudes toward change were positively related to Group Change scores, while supervisors' scores on a measure of authoritarianism were negatively related to Group Change scores, while supervisors' scores on an index of human relations attitudes were unrelated to attitudes of the group toward change. (6) Among employees who perceived increases during the preceding year in variety, skill and responsibility demands, and chances for promotion, approval of these increases was associated with higher change Scale scores than indifference or disapproval. This evidence provided tentative support for the view that readiness for change is related to employee

Tuggle, G. Job enlargement: An assault on assembly line inefficiencies. <u>Industrial Engineering</u>. 1969 (February), 27-31.

Describes modular assembly operations in which work elements Describes modular assembly operations in which work elements are combined and the longer elements! times are balanced by shorter ones. Adventages of modular assembly are improved quality, greater scheduling flexibility, simpler to trace rejects, and spot workers who need additional training. Disadvantages include duplicate tools and fixtures, more floor space, increased training, need for complex handling system and limitations of product size and characteristics.

Describes three examples of modular assemblies:

- 1. An Iows producer of drive mechanism changed from a An lows producer of drive mechanism changed from a carousel eight-man assembly line to an individual assembly station where complete job is assembled by one worker including testing. Change resulted in 37% reduction in labor costs and drop in reject rate from 5% to 0.5%.
  - A Wisconsin manufacturer of domestic furnaces changed A Wisconsin manufacturer of domestic furnaces changed from a batch production on assembly line with run of two-three days, two lines, five products, due to quality complaints. A modular assembly unit consisting of eight independent assembly lines each manned by two workers with 10-12 minute cycle times were set up. Each line ran eny of the five models. Results indicated 80% reduction in complaints and gain in scheduling flexibility.
  - 3. A Visconsin appliance manufacturer changed from a five product, two conveyor, one minute cycle time for product, two conveyor, one minute cycle time to a man-woman assembly team which assembles the entire unit. Results indicate 24% reduction in assembly labor costs.

Turner, A.N. Management and the assembly line. Harvard Business Review, 1955, 33, 40-48.

Discusses basic assumptions about human motivation and capacity which are held at all levels of management. These assumptions reinforce undesirable effects of assembly line technology and must be counteracted. Mechanical pacing and repetitive job patterns are sources of worker dissatisfaction because they cause feelings of too much pressure and impersonality. These methods violate formal engineering rationale and management behavior.

Author recommends experiments to introduce more worker partici-pation and more interest and variety in assembly line jobs. Measures to counteract pressure of assembly line include managements recognition of individual differences in work pace, trusting workers willingness to work, removing management pressure to produce from workers on line, job rotation and delegating responsibility to workers.

Concludes that studies have repeatedly shown that successful foremen counteract technological influences of pressure and imperonality.

Turner, A.M., & Lawrence, P.R. Industrial jobs and the worker: investigation of response to task attributes. Boston: Harvard University, Graduate School of Business Administration, 1965.

investigation of response to task attributes. Boaton: Harvard University, Graduate School of Business Administration, 1965.

Reports on a comprehensive study of the attitudinal behavioral responses of workers to different aspects of their jobs. The original hypotheses were that workers respond favorably (high satisfaction and low absence rates) to jobs which are more complex, have more response would accompany high-level jobs. The hypothesis concerning attendance was confirmed for a sample of 470 workers from 11 industries working on 47 different jobs. The hypothesized positive relationship between job level and satisfaction was not supported. This finding plus the presence of a number of curvilinear relationships led Turner and Lawrence to the conclusion that the workers in the sample had been drawn from two separate and distinct populations whose members responded in different ways to similar job characteristics. The investigators, by splitting their group of workers on a succession of variables and analyzing the relationship between task attributes and job satisfaction, were able to determine that workers from factories located in small towns responded dramatically differently from workers who came from more urban settings. The workers from mall-town settings tended to respond to task attributes in the manner predicted by Turner and Lawrence. Workers from cities indicated no relationship between task attributes and attendance and responded with low job satisfaction to supposedly desirable job attributes and with high satisfaction to such "undesirable" attributes as repetitiveness. Turner and Lawrence posited an explanation based on a notion of alienation que anomie. They would fail to develop strong group or subcultural norms and valued would fail to respond positively to the white-coller-oriented values attached to larger, more autonomous, more skilled jobs. Rather than ignoring the effects of individual differences or attributing them to change, Turner and Lawrence were able to determine that the unexpecte

Turner, A.N., & Miclette, A.L. Sources of satisfaction in repetitive work, Occupational Psychology, 1962, 36, 215-231.

Interviewed 115 female assembly workers from an electronics plant. Even though the work was extremely repetitive and routine, most of the workers expressed satisfaction with the work itself. The main sources of dissatisfaction cane from the sense of being caught in a quantity-quality aqueeze and the interruptions from staff and supervisory personnel. Object, batch, line, and process traction were discussed as sources of satisfaction. Thus, repetition (job size) slone is a poor indicator of worker response and the various sources of positive motivations of repetitive work must be considered. be considered.

Tuttle, T.C., & Cunningham, J.W. Affective correlates or system-atically derived work dimensions: Validation of the Occupation Analysis Inventory. JSAS Catalog of Selected Documents in Psycho-logy, 1974, 4, 147.

An attempt was made to demonstrate significant relationships between systematically derived occupational descriptors and selected measures of worker characteristics in the affective domain. The occupational (predictor) variables were derived from the occupation Analysis Inventory (OAI) and consisted of (a) work-dimension scores describing occupations in terms of work activities and conditions, and (b) attribute-requirement estimates characterizing occupations in terms of various human attributes for which there are tests. The worker (criterion) variables were based on the responses of job incumbents to selected interest, need, and satisfaction questionnaires. It was proposed that significant relationships between these two sets of variables would provide support for the construct validity of the occupational descriptors. The Ohio Vocational Interest Survey, the Minnesota Importance Questionnaire, a: I the Minnesota Satisfaction Questionnaire were administered to job incumbents in selected occupations. In addition, existing data were obtained for incumbents in a sample of occupations of the Strong Vocational Interest Blank. Occupations Reinforcer Pattern scores for another sample of occupations were obtained from the Minnesota Work Adjustment Project. All occupations for which the above criterion data were obtained were rated on the OAI, and these ratings were used in deriving work-dimension scores and attribute-requirement estimates for the occupations. The results of various statistical analyses generally supported the construct validity of the OAI descriptors. Seven general scores and attribute-requirement estimates for the occupations. The results of various statistical analyses generally supported the construct validity of the OAI descriptors. Seven general hypotheses concerning relationships between occupational and worker variables were tested of which five received substantial support, and the remaining two were at least partially supported. It was concluded that the OAI work-dimension scores and attribute-requirement estimates for occupations possess demonstrated relevance to the interests, needs, and satisfactions of job incumbents.

Uris, A. Mogy's work simplification is working new miracles. <u>Factory</u>, Sept., 1965, 112-115.

Description of Allan H. Mogensen's work simplification as a mo-tivational technique. Five step pattern of work simplification is as follows

Step 1 - Select a job to improve

Step 2 - Get the facts and make a chart Step 3 - Challenge every detail Step 4 - Develop a better method Step 5 - Install the improvement

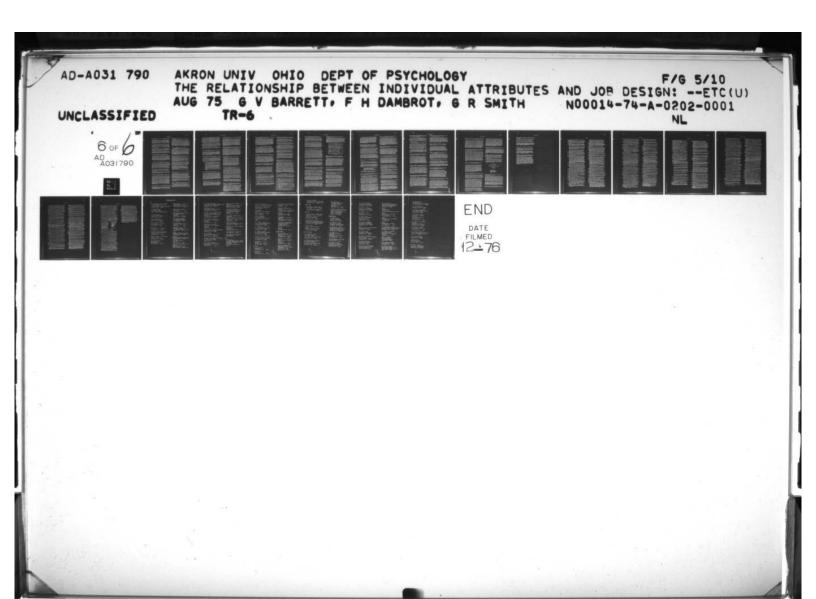
Motivation oriented work simplification includes worker participation, involvement and understanding of company objectives and changes. The individual employee has the opportunity to assume a role-that of the part-time methods angineer that enlarges the part he plays in the crganization.

Briefly describes Proctor & Gambles work simplification program in area of costs savings, American Viscose quality program, applica-tions of work simplification to paperwork and Rochester Gas and Elec-tric program for management development.

U.S. Department of Health, Education, and Welfare. <u>Mork in America:</u>
Report of a special task force to the Secretary of Health, Education, and Welfare. Cambridge: The MIT Press, 1973.

Report prepared at request of Secretary of Health, Education & Welfare for a broad-gaged study of the institution of work. Task force was headed by a social enthropologist, four members of federal govt., two university members, a foundation, a research institute and a community agency

The report is divided into the following seven chapters: (1)
Punctions of work (2) Morker diseatisfaction (3) Physical & mental
costs of worker diseatisfaction (4) Design of work (5) Vocational
development (6) Federal policy (7) Conclusion. The appendix summarizes
in tabular form 34 projects involving job design and lists 39 papers
commissioned by the Upjohn Institute for the study and scheduled for
separate later publications.



U.S. News and World Report. The drive to make dull jobs interesting. July 17, 1972, 50-54.

Reports on job enrichment projects in several industries. At Corning Glassware in Medfield Mass, assembly line was abandoned and 6 female employees were given enriched jobs assembling entire electrical hot plates including freedom to schedule their work responsibility for quality testing and accountability for quality of final product. Results indicated that within six months of the enrichment project, absenteeism dropped from 8% to 1% and product rejects from 23% to 1%.

An auto mirrormanufacturer bonnelly Mirrors instituted a long term enrichment-incentive plan for all employees (M=460). Morkers determined their own salary increases. Bonuses were paid to workers on the basis of productivity. Morkers were organized into task-oriented teems with responsibility to decide assembly line pace, breaks and quality. Wages.costs and profits have increased despite lowered prices of company products.

At two new General Electric Plants, a program of employee participation was instituted which included work teams of 25 employees meeting monthly with supervisors to discuss problems, experiences, and suggestions. Project which involved greater worker recognition and participation resulted in employees voting down a union.

Gaines Pet Food Plant in Topeks, Kansas divided work force into 3 specialized teams: processing, shipping and office work. Job retation program resulted in decrease in absenteeism, pliferage and production costs (10% decrease). Productivity rose 10%.

U.S. Office of Management and Budget, <u>Social Indicators</u>, 1973, Wash. D.C., U.S. Government Printing Office, Stock No. 0324-00256,

Four years of research to bring together data they regard as the most revealing of how Americans are faring when it comes to getting what it is assumend everyone wants: health, long life, nice joh, nice living conditions and freedom from crime. The report is mainly composed of charts and graphs denoted to eight areas: health, public safety, education, employment, income housing, lefaure and recreation, and population. It brings them together for a wide angle statistical look at American society and civilization. Some 90% of the individuals sampled were reasonably satisfied with their jobs.

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Van Book, H.G. The influence of assembly line organization on output, quality and morale. <u>Occupational Psychology</u>, 1964, 18, 161-172.

Reports study of assembly line of N.J. Phillips Company television receiver factory (Netherlands). Assembly line was studied from three points of view: output, quality and morale. Investigated influence of following variables on assembly output using Monte Carlo simulation technique (1) presence or absence of bufferstocks (2) length of assembly line. Results indicated that the loss percentage in a line without bufferstock is about four times larger than in a line with bufferstock between workers. Losses in balance and system time increase with increasing length of the line. The shortcest weiting time is found in the shortest lines with intervening space between work-places.

Results indicated that regular medium speed workers produced higher quality products. Concludes that shorter line with bufferstock between adjacent workplaces offers most favorable condition to schieve good quality.

In a study of morale it was found that there was a clear connection between morale and the size of the group: the small group with bufferstock appeared to have the best morale.

Van de Ven, A.H., & Delbecq, A.L. A task contingent model of workunit structure. <u>Administrative Science Quarterly</u>, 1974, 19, 183-194.

A model for explaining structural variations between work units within the complex organization is presented. Based upon an analysis of the impact of task difficulty and task variability on intraorganizational structure, a taxonomy of alternative work-unit structures is derived. The taxonomy sugests that work units within a complex organization can be classified into three basic structural modes: (1) a systematized mode, (2) a service mode, and (3) a group mode; with variations in each mode. However, the structural distinction between modes is one of kind or "type," while the distinctions within modes is one of degree. Data on 120 work units within a large government employment-security agency are presented. Empirical support was found for the taxonomy. The work units sampled at six different levels of structure; (routine service, routine system, technical service, technical service, intensive service, and design group did discriminate empirically on the bases of task difficulty and variability using a fimed-effects model, and were shown to fit in different cells of the taxonomy es predicted.

Vinocur, J. Sweden tilts with tedium. Rochester Democrat and Chronicle. Hov. 12, 1972, SC - 6C.

Howepaper report of Volvo assembly line 4 Seab auto plant involving team approach to assembly operations, and pace controlled by worker. Initial results report 10% decrease in employee turnover, and improvements in quality and safety. Vroom, V. H. Ego-involvement, job satisfaction, and job performance. Personnel Psychology, 1962. 15, 159-177.

Reports on data from industrial workers in an oil refinery and electronics manufacturing corpany which support the following conclusions: (a) Persons ego-involved in their jobs are rated higher in job performance than those not so ego-involved. There is also a tendency for the relationship between ego-involvement and performance to be greater for persons high in autonomy, although the results are not significant. (b) Job satisfaction and satisfaction with self of persons ego-involved in their jobs is significantly more positively related to the amount of opportunity for self-expression in their jobs than is the case for persons low in ego-involvement. Similar but non-significant differences were also found for measures of satisfaction with health, reported feelings of tension, and frequency of absences.

Vroom, V.H. Mork and motivation. New York: Wiley, 1964.

Mork and Motivation gives a complete analysis of the interrelationships between human motivation and the work that people perform. The author has drawn on nearly a half century of research by
psychologists, economists, and sociologists to create an integrated
picture of existing knowledge of the motivational determinants of
occupational choice, job satisfaction and job performance. No simple
nostrums for helping people to make better occupational choices or
for making workers happier or more effective are given here. The
work focuses on the development of a conceptual model of motivation
that is consistent with the results of research conducted in both
basic and applied settings. The consistent use of this model provides a background against which specific findings are interpreted
and new hypotheses are suggested.

Wahba, M. A., & Bridwell, L. G. Maslow reconsidered: A review of research on the need hierarchy theory. Academy of Management, Proceedings of 33rd Annual Meeting, August, 1973, 514-520.

Review of research literature testing three elements of Muslow's need hierarchy theory: (1) need classification scheme. (2) the deprivation/domination proposition, (3) the gratification/activation proposition. A review of 8 factor analytic studies concluded that none of the studies yielded five independent need categories. Some evidence exists for two types of needs—higher and lower. Self-actualizing needs may emerge as an independent category, but it may not be a need but simply a social desirability response resulting from cultural values.

Studies that have tested the deprivation/domination aspect have used the Porter Need Satisfaction Questionnaire. Results indicate that the deprivation/domination proposition is partially supported for self-actualization and autonomy, but not for security, social and esteem needs. Studies of satisfaction and judged importance showed a V relationship; the higher the natisfaction or dissatisfaction, the higher the ranked importance. These studies indicate that the proposition that the most deficient need will dominate may not be as simple as suggested by Maslow.

The third element of the theory—gratification/activation—states that need satisfaction decreases going up the need hierarchy and that the higher the satisfaction of a need, the lower the importance of the need, the higher the importance of a need at the next level. Two longitudinal studies using cross-layed cerrelational analysis did not support the gratification/activation portion of the theory.

The authors state that Meslow's need hierarchy theory is almost untestable.

Walker, C.R. The problem of the repetitive job. <u>Harvard Business</u> <u>Roviou</u>, 1950, <u>28</u>, 54-58.

A plan of "job enlargement" in the Endicott Plant of the IBM Corporation was developed as a means of decreasing the monotony of repetitive jobs. The procedure, which affected several hundred operators, was to add skills and responsibilities to the minimum skills of the single-operation worker. It was expanded from the operation alone, to setting-up the job in the machine, sharpening tools, and inspection. Benefits resulting were: (1) a better quality product, (2) less idle time, for both machines and operators. (3) an enrichment of the job to the workers, in both psychic and financial income. Further, the program resulted in eliminating one supervisory level, with a consequent growth in prestige for the workers.

Though some might consider this article a heuristic success, it presented little in the way of data. There was no control for a Reuthorne effect, and no data were presented which concerned satisfaction, turnover, costs, etc.

Walker, C.R. Toward the automatic factor: A case study of men and mechines. New Maven, Connecticut: Yale University Press, 1957.

Study of workers adjustment to basic change in technology of work task. Between 1949 through 1951 a research tenm conducted three sets of interviews with workers involved in the operation of the first sutematic continuous seamless pipe mill in the U.S. Contrasts work task in the automatic mill to the old hand method to show the amount and direction of behavior change required by the new technology.

One of the major conclusions is that changes in technical behavior first encountered by workers became the center of major job disastisfaction. When the men became habituated to new tasks those same job tasks became the source of subjective satisfaction. Following task and other variables were found to interact with worker's personality characteristics: Faith in machine or technological process; the rate, quantity and variability of pay measured against personal input of effort; belience between company take and worker take from technological improvement, job insecurity, physical drudgery or intellectual demands of jobs, career progress, daily and hourly continuity of work and personalitation of the inanimate production machines.

Two features of work are especially notable as having consequences for the individual's personality system. The first is that where job features are intrinsically unsatisfactory for the person, his attachment to the organization is largely through the formal bond of earnings for their instrumental value in buying a living in the community. The second major conclusion is that specific job content is a world of private satisfactions for those who work is or with the job.

The need for sociability on the job is revealed repeatedly. Bo series adequate management policy is carrying out technological

Walker, C.R. <u>Modern technology and civilization</u>. New York: McGraw-Hill Book Company, Inc., 1962.

The book deals with four topics arising out of the relationship between man and the machine. First, it attempts to put technology into the perspectives of time, space, and history. Second, it looks at the problems and promises technology holds for Western countries in our own day. Third, it looks at technology in non-Western countries and lastly, it explores the unprecedented human problems and opportunities posed by modern technology.

Walker, C.R., & Guest, E.H. The man on the assembly line. Cambridge: Barvard University, 1952.

Reports interview study of 180 auto production workers selected from total work force of 1068. Average age of workers was only 27 years. Principal areas explored were previous work experience, ac-titudes toward job itself, human relationships on the job, pay and security, supervision, working conditions, promotion and transfer and the union. Pesults indicated that absenteeism and turnover is greater on jobs where mass production characteristics are more pronounced. Other results are briefly summarized as follows:

- Of the people in mass production, a smaller number are on production-line jobs than some people outside industry suppose: and production-line jobs vary widely in complexity. Possibly the classic case of the man who just tightens bolt No. 479 is completely fictional.
   Most people like more variety in their work than the usual production-line job provides; yet, boredom is greatest when the job is neither so simple that you can think about other things nor so difficult that it is mantally absorbing.
   About 10% of the man appear to like or be indifferent to the special characteristics of production-line jobs.
   Most disliked feature of production-line work is mechanical pacing.

- pacing.

  5. Social isolation (as by noise or character of the work) is considered by the men to be an important reason for not liking some jobs.

Walker, J., & Marriott, R. A study of some attitudes to factory work. Occupational Psychology, 1951, 25, 181-191.

Provide data indicating that more than a third of the employees of mass production factories complained of boredom, but in rolling mills the proportion was only 6%. Boredom was more widespread among conveyor workers, and workers were less satisfied on such jobs if they had previously held a skilled job. Data came from interviews with 976 men from three large factories. This seems to be evidence supporting the traditional model which related uniformity and repetition in work to dissatisfaction. Individual differences in worker responses were considerable, and, in fact, "Many liked their work because it was simple, straightforward, and carried no responsibility." Differences between factories were attributed to differences in production techniques rather than to differences between the persons making up the work forces of the factories.

Welter, R.W. The need for job enrichment is urgent. <u>Industrial</u>
<u>Engineering</u>, 1972, (July), 14-16.

Discusses problems of low productivity, poor quality production, employee turnover, sheenteeism and union insues. Relates failure of management's efforts in area of reduction of work week, expansion of vocation, increased salaries, incentive pay plane, and recreation programs. Concludes that job enrichment and the redesign of jobs cas raise production by 50%, reduce errors by 30%, and result in substantial cost savings.

Walton, R.B. How to counter slienation in the plant. Harvard Business Review, 1972, 50, 70-81. (a)

A plant where work teams perform without supervisors, where many decisions are based on employee consensus, and where most of the staff functions are assigned to line operators—in what future organization would such a phenomenon exist? "Probably in most," says this author, "because such radical innovations are part of the emerging answer to alienation in the workplace." He argues that total, "systematic" restructuring of the way work is done is required to both seet the changing expectations of employees and increase productivity. Some companies, in fact, have already used this approach with considerable success—and they have the productivity and high morals to prove it. After analysing the employee disastisfaction that dictates the innovation he recommends, the author draws lessons from a redesign effort implemented in a pet-food plant by a particularly foward-looking organization (General Poods).

Walton, R.E. Topeka General Foods Plant. Unpublished paper. Available from Richard E. Walton, Harvard University Graduate School of Business Administration, Soldiers Field, Roston, Mass., 02163, 1972. (b)

In designing this new plant in 1971, management sought to solve problems of frequent shutdown, costly recycling, and low product. Morkers (N=70) were organized into relatively autonomous work groups with each group responsible for a large segment of the production process. Operators were given responsibility for staff functions, and more decision making. A single job classification system was used with psy increases based on the total number of jobs a worker could do. Early results indicated positive assessment of the plant by both team members and leaders. Plant is operated by 70 workers rather than 110 estimated as mesessary by industrial engineers. Several problems emerged e.g. tension over compensation scheme, excessive group pressures on individual workers and operators unwillingness to accept breader responsibility.

Walton, R.E. Quality of working life: What is it? Sloam Management Review, 1973, 15, 11-21.

Proposes 8 major conceptual categories for analyzing the salient features of the quality of working life (1) adequate and fair compensation (2) safe and healthy working conditions (3) immediate opportunity to use and develop human capacities including autonomy multiple skills, information and perspective, whole tasks and planning (4) future opportunity for continued growth and security (5) social integration in the work organization (6) constitutionalism in the work organization (7) work and total life space (8) the social relevance of work life. These eight conceptual categories are related to several types of snalyses including productivity, chances over time, salience for different groups of employees, and relationship between the eight categories. Welton projects pessimistic trends of aggressively expressed alienation as a result of slower organizational change in comparison to employee expectations.

Walton, R.E. The diffusion of new work structures: Explaining why success didn't take. Organizational Dynamics, 1975, 1, 3-22.

Study of eight organizations (Corning Glass, General Foods, Alcan, Shell U.K., Morsk Hydro, Volvo, Hunnfos Puip, and Korthern Electric) which began work redesign projects in the 1960's. All of the early work restructuring projects were judged initially successful. The current study explored the diffusion of these projects throughout the company. The diffusion process followed a general pattern or model as follows: Step 1 - initiation of pilot experiment; Step 2 - pilot experiment declared early success: Step 1 - recognition and resources provided for further work restructuring; Step 4 - more general interest in work restructuring around; Step 5 - change agent's interventions extend throughout corporate system; Step 6 - facilitating networks develop; Step 7 - personnel movement occurs.

Problem areas in diffusion include regression in the pilot pro-ject, poor model for change, confusion over what is to be diffused, inappropriateness of concepts employed, deficient implementation, lack of top management committement, union opposition, bureaucratic berriers, threatened obsolescence, and self-limiting dynamics. The following factors influenced diffusion rates cost benefit or relative advantage and communicability of project, pervasiveness, reversability, and number of getekeepers.

Concludes that in eight companies studied the rate of diffusion has been slow because work restructuring requires an increase in local autonomy thereby threatening the power of central staff groups and some managers. It also threatens to make some roles obsolete or to eliminate some staff specialists and first line supervisors.

Wanous, J.P. Individual differences and employee reactions to job characteristics. Proceedings of the Alat Annual Convention of the American Psychological Association, 1973. §, 599.

Compared 3 different methods of measuring individual differences relevant to job redesign on their usefulness as moderators of employee resertion to job characteristics. About 80 newly hired female telephone agerators were tested on the 3 methods; using these veriaties as moderators of 3 relationships (1) job description/specific job satisfaction (2) job description/job behavior (3) job description/severial job satisfaction. The moderator variables were urban vs. sweel beautypeund, high vs. low belief in the Protestant Ethic, and high vs. low "higher order" need etrength. Results indicated that higher order need strength is the best way to measure these differences. The Protestant Ethic showed some usefulness as a moderator, but urban/reval background differences did not affect employee reactions to job characteristics.

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Wanous, J.P. Individual differences and reactions to job characteristics. Journal of Applied Psychology, 1974, 59, 616-622.

Three different methods of measuring individual differences (ID's) were evaluated as moderators of employee reactions to job characteristics. The three methods are urban vs. rural background, strong vs. weak belief in the Protestant Work Ethic, and high vs. low strength for "higher order" needs. Each of these three methods was used as a moderator of the relationships between job characteristics on the one hand. and specific job facet satisfaction, overall job satisfaction, and job behavior on the other hand. Based on the job satisfaction results, higher order need strength is the most useful way to measure this type of individual difference, followed by the Protestant Work Ethic, and lastly by urban vs. rural background of the worker. There were no differences among the three ID's as moderators of the job characteristics and job behavior relationship.

Wanous, J.P., & Lawler, E.E. III. Measurement and meaning of job satisfaction. Journal of Applied Psychology, 1972, 56, 95-105.

Reviews nine operational definitions of job satisfaction. Date are reported for 208 employees of an eastern telephone company on the relationship between each of these definitions and observational and questionneire measures of overall job satisfaction. Some operational definitions did not yield empirically comparable measures of satisfaction, although several correlated with an overall rating of job satisfaction and with absenteedsm. Convergent and discriminant validity matrix analysis suggests that it is possible to validly measure people's satisfaction with different facets of their jobs. Implications for the development of a theory of job satisfaction are discussed.

Ware, J.R., Kowel, B., & Baker, R.A. The role of experimenter attitude and contingent reinforcement in a vigilance task. <u>Human Factors</u>, 1964, <u>5</u>, 111-115.

Investigated experimenter effects and reinforcement in vigilance task. Experimenter attitude toward one group of monitors was democratic (expansive and permissive) and experimenter attitude toward
another group was autocratic (brief and brusque). Both groups monitored under three conditions of environmental stimulation (1) control
(no stimulation) (2) radio contingent on detection performance, and
(3) radio non-contingent on detection performance. The group treated
in a democratic manner showed significently higher levels of detection
performance on all three conditions of environmental stimulation. The
performance under radio contingent and radio non-contingent conditions
was elimificently higher then the control condition, and the radio
condition contingent showed no performance decrement.

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Warm, J. S., Riechmann, S. W., Grasha, A. F. & Seibel, B. Motivation in vigilance: A test of the goal-setting hypothesis of the effec-tiveness of knowledge of results. <u>Psychonomic Science</u>, 1973, <u>1</u> (5A), 291-292.

This study tested the prediction, derived from the goal setting hypothesis that the facilitating effects of knowledge of results (KR) in a simple vigilance task could be related directly to the level of the performance standard used to regulate KR. Two groups of Ss received dichotomous NS in terms of whether Ss response times (RTs) to signal detections exceeded a high or low standard of performance. The aperiodic start of a visual signal was the critical event for detection. The vigil was divided into a training phase followed by testing, during which KR was withdrawn. Knowledge of results enhanced performance in both cases. However, the two standards used to regulate feedback contributed little to these effects.

Warren, H.D. Job simplification versus job enlargement. <u>Journal of Industrial Engineering</u>, 1958, 2, 435-439.

Critical review of effects of job specialization and job enlargement. Reports that relatively little scientific research has been dor in the area of the effects of job specialization (e.g. degrades worked diminishes satisfaction and decreases efficiency). Warren makes a clear distinction between monotony and boredom and points to the role of individual differences in susceptibility to boredom.

We feels that reports of positive results of job enlargement programs are still largely anecdotal. Research in this area must be controlled and consider the criterion problem.

Production may not be the sole basis for evaluating a given job design. Employee turnover, absenteeism, whete and accidents must also be considered,

Concludes that a research team approach should be adopted to evaluate job enlargement. He predicts that one principle of job design, the seeds of the workers with regard to the work itself is an important so the workers needs for financial reward, security or status.

Masson, D. Some relationships among motivation, intelligence, tonure and absentecism. Unpublished Doctoral Dissertation, Case Western Reserve University, 1971.

This study was an attempt to demonstrate some of the relationships between motivation, intelligence, tenure and absolute and the control of the study was the Motivation-Hygiene theory of Frederick Herzberg. The major object was to demonstrate the dynamic nature of the relationships between the variables studied.

The instruments used included the Job Motivation Index, the Job Reaction Survey and the Otis Gamma Test of Mental Ability. They were given to three groups of people: key punch operators (N=52), tellers (N=59), and accounting officers (N=54).

Differences in seniority did not produce differences in variance in intelligence and Motivation Orientation as measured by the Job Motivation Index. However, intelligence and seniority were negatively correlated for the total sample, the tellers, and the accounting officers. Motivation Orientation and job seniority were positively related for the key punch operators. These relationships were held to support the view that the passage of time moves people at different levels of intelligence and Motivation Orientation to resign at differing rates.

A second purpose of this study was to show that the passage of time affects the way in which jobs are seen and thus also affects absenteeism rates. Genorally, it was found that increasing seniority was associated with greater perception of motivators on the job. No relationship between seniority and absenteeism rates was found.

In other findings, it was discovered that high intelligence was associated with low perception of motivators. Furthermore, there was some evidence that the amount of Motivation Deprivation varied as job complexity varied while there was no variation at all in Hygiene Deprivation from one job level to another.

Finally, serious question was raised as to the independence of the hygiene and motivator scales of the Job Motivation Index. Strong positive correlation between these scales was found in this study.

Watson, W.J. The similarity of job types reported from two independent analyses of occupational data. <u>JSAS Catalog of Selected Documents in Psychology</u>, 1974, 4, 98.

Occupational analysts using Comprehensive Occupational Data Analysis Programs (CODAP) make subjective decisions at various stages in their analysis of an occupation. The possibility exists that two different analysts could reach different conclusions in analysing an occupation, and thereby provide divergent guidance to management. Two analysts, working independently, performed job typing using CODAP on occupational data collected by a single administration of a job inventory. Each analyst selected the same size sample, at random but without any cases common, from the total survey. The job types identified by each analyst were compared to determine whether they were significantly different in any respect. Superficial differences appeared between the results of the two analyses, but were largely resolved when job types reported by the first analyst were compared not only on a one-to-one basis with job types reported by the second analyst, but also with combinations of job types reported on the second occasion. In summary, all job types identified by the first analyst were identified by the second with the exception of six small job types accounting for 73 cases, while there were some variations in the size and nature of the job type stope from one analyst to another, differences were sufficiently small that a manager using either analysis should have made essentiall the same decision.

Weaver, C.M. Correlates of job satisfaction: Some evidence from mational surveys. <u>Academy of Management Journal</u>, 1974, 17, 173-375.

Reviews four Gallup Polls, 1963-69 relative to job satisfaction Folls are hased on one question. On the whole would you say you are satisfied or dissatisfied with the work you do? Samples are males 21 years or older fully employed. Sample sizes are 1488, 699, 1403, and 711.

Among the more important findings for those male employees are the following:

1. Although there is a positive relationship between income and job satisfaction, there apparently is an even stronger association between satisfaction with income and job satisfaction.

2. Employees who report satisfaction with their housing situation are more likely to report satisfaction with their jobe. These two variables are probably the joint result of a separate influence, however, such as income.

3. There is little important variation among the reports of job satisfaction at different levels of education.

4. Reports of job satisfaction appear to be higher for employees in professional, farm, and skilled blue-collar occupational categories than for workers in the unskilled category.

5. Blacks report levels of job satisfaction which are considerably lower than those of whites.

6. There is no consistent pattern of association between employee age and job satisfaction.

7. Protestants and Catholics do not differ meaningfully in reported job satisfaction.

8. Church strendence leaks important association with job satisfaction.

9. Males living in amaller households report higher levels of

faction.

9. Males living in ammiler households report higher levels of job satisfaction than those living in larger households.

Weaver, C.B. Job preferences of white collar and blue collar workers. Academy of Management Journal, 1975, 18, 167-175.

Study reports a secondary analysis of the responses of white collar and blue collar workers who were part of a 1973 survey (New 1970 representative of U.S., population 18 years of age or over). The respondents were asked to select the one characteristic which they most preferred in a job from the following: A. high income; B. no danger of being fired; C. short working hours; D. chance for advancement: E. work important and gives a feeling of accomplishment.

The results suggest the existence of important similarities between white and blue collar workers in that the one intrinsic characteristic is by far the most important of the five to both white and blue collar workers. The findings of this study suggest that the oft reported differences between white and blue collar workers has obscured the broad extent to which the two groups are similar. Make collar workers were more concerned than blue collar workers about intrinsic job characteristics but 2 of 4 differences in preferences for extrinsic job characteristics between white and blue collar workers fail to reach statistical significance.

Wedderburn, D., & Crompton, R. <u>Morkers' attitudes and technology</u>. Cambridge: Cambridge University Press, 1972.

Represents a continuation of earlier research by industrial sociologists at Cambridge University on attitudes of the industrial worker and how they are affected by factors both within and outside the work situation. The book reports results of an empirical case study of workers employed by a large chemical firm called Searnass located in Northeastern England. A structured interview approach involving a 5% sample of work force was used to ascertain workers attitude toward the company, management, immediate supervision, work itself and pay. Primary result was that the production tasks and associated control systems create situations in which the actual work experience and authority relationships differ markedly. Employees in continuous process jobs were more satisfied with various facets of their jobs than employees engaged in large batch tasks. Although similarities exist between manual workers and tradesmen it was found that tradesmen expect more of the job and are more conscious of status. The workers as a whole evidenced an instrumental view toward work.

The study has some limitations in the area of research design and statistical analysis. Its principal contributions are (1) The recognition of variation of task within the same firm and technological process and (2) The interacting role of the production process and the control system in emplaining organisation behavior.

The original survey showed that the best things about working for the company were security, good physical working conditions, fringes, and welfare. The worst things were bad management and feelings of regimentation. Attitude and perceptions about supervision differed greatly with type of job. Emplanations for some of the findings rested partly with specific technological differences between the three plants and in the resulting characteristics of the jobe.

Weinstein, A. G., & Holzbach, R. L. Impact of individual differences, reward distribution and task structure on productivity in a simulated work environment. <u>Journal of Applied Psychology</u>, 1973, 58, 296-302.

Analyzed the effects of intragroup competition on group productivity within a research design which account for both individual differences and experimental effects. Seventy-two college students wers given the Minnesota Clerical Test and then randomly assigned three-man groups in one of four conditions; differential and equal reward distribution and high and low task-flow interdependence. In the differential reward condition, individual coding most correct received 1/2 of group earnings, second person 1/3 and third person 1/4. In equal reward each subject received 1/3 of groups earnings. In low task flow condition each subject coded three responses for each questionnairs. In high task flow each subject coded one response for each questionnairs and passed it on to the second and third person.

The findings support the hypothesis that competitive reward conditions yield greater productivity than equal reward conditions and that low task-flow interdependence yields higher productivity than high task-flow interdependence. A combined differential-emperimental design accounted for considerably more variance than either the differential or emperimental design alone. The Minnesotta Clerical Toot mamerical scale was differentially related to productivity depending on the reward and task low interdependence conditions.

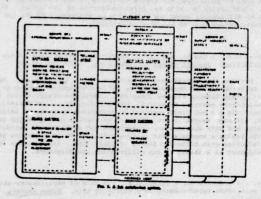
Weissenberg, P., & Gruenfeld, L.W. Relationship between job satisfaction and job involvement. <u>Journal of Applied Psychology</u>, 1968, 32, 469-473.

Investigated the relationship between motivator and hygiene satisfaction variables to job involvement. So were 96 civi: service supervisors who completed the Wernimont Job-Satisfaction scale and a job-involvement measure developed by Lodahl and Kejner. It was found that motivator, but not hygiene, satisfaction variables cervalated with job involvement. Total motivator satisfaction scores accounted for considerably more variance in everall job satisfaction than did hygione variables.

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Werniment, P.F. A systems view of job satisfaction. <u>Journal of Applied Psychology</u>, 1972, <u>56</u>, 173-176.

Briefly comments on the controversy surrounding the unidimensional versus two-factor assertions about employee job satisfaction. It seems more suitable for a logical and semantic analysis and solution than to an empirical or research resolution. It is shown in this article than textrinsic factors must be viewed as the causes of intrinsic factors. It is further shown that the relationships among job satisfaction variables can be more effectively studied and research findings can be more effectively explained when the entire system is viewed from the fellowing systems perspective as diagrammed below:



Mernimont, P.P., Toven, P., & Kapell, H. Comparison of sources of personal satisfaction and of work motivation. <u>Journal of Applied Psychology</u>, 1970, <u>54</u>, 95-102.

Determined what differences technical employees see in various job factore, as they affect job effort and job satisfaction. About 775 scientists and technicians ranked personal accomplishment, preise for good work, getting along with co-workers, company location and receiving credit for ideas as having a greater impact on personal satisfaction. Knowing what is expected of one, having a capable supervisor, having challenging work and responsibility, being kept informed and participating in decisions, were all given more importance for their effects on motivation or job effort. These results indicate that it is incorrect to use the terms "motivator" and "satisfier" interchangeably. Those factors which seem to have a heavier impact on motivation than on satisfaction do not fall into a mest classification system of intrinsic vs. extrinsic or self-actualisation vs. security. Results lend support to expectancy theory of work motivation.

Wharton D. Removing monotony from factory jobs. American Mercury, 1954, 91-95.

Journalistic report of job enlargment projects at IBM - Endicott, How York, IBM factories in France, and IBM - Poughkeepsie, New York, Includes brief description of job enlargement project at Detroit Believe involving billing clerks.

Wheaton, G.R., Rose A.M., & Fingerman, P.W. Methods for predicting job ability requirements. Final Report, Sept., 1975, American Institutes for Research. Contract Monr M00014-72-C-0382, MR 151-347, Office of Maval Research.

This report describes the fourth and final study in a program of research dealing with the relationship between the characteristics of human tasks and the abilities required for task performance. The goal of the program has been to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. Such knowledge has important implications for both selection and training of personnel.

The three previous studies examined the relationship between variations in an auditory signal identification, a trouble-shooting, and a problem-solving task, and consequent changes in the abilities related to task performance. Task characteristics were generally manipulated by varying difficulty and perceptual complexity. In each study subjects performed the criterion task under the different experimental conditions, and then re-osived a battery of reference teste designed to measure abilities which were hypothesised to relate to performance.

The results of these studies were that complex changes in the ability requirements related to performance occurred in response to variations in task characteristics. These results suggested that certain task variations changed the nature of the task in such a way that subjects changed their approach to, or strategy for dealing with, the task.

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In the fourth and final study, possible interactions among task variations, ability profiles and subject strategies were examined within the context of the troubleshooting and problem-solving tasks previously studied. Subjects' strategies were defined in terms of their method of problem solving under each level of task difficulty and perceptual complexity. Subgroups adopting one of several kinds of strategy were then analyzed to determine the relationships between abilities and strategies, and strategies and performance. In general, knowledge of a subject's problem-solving strategy was useful in obtaining a clearer understanding of ability requirements under different conditions of task performance.

Wheaton, G.R., Shaffer, E.J., Mirabella, A., & Fleishman, E.A. Methods for predicting job ability requirements. I. Ability requirements as a function of changes in the characteristics of an auditory signal identification task. Technical Report No. R73-5, Sept. 1971, American Institute of Research, Contract Monr B00014-72-C-0382-MR 151-347, Office of Neval Research.

Investigated the relationship between variations in an auditory signal identification task and consequent changes in the sbilities related to identification performance. Characteristics of the signal identification task were sanipulated by varying signal duration and signal-to-noise ratio. Subjects received a battery of reference ability tests and then proceeded to perform the criterion task under the different experimental conditions. To determine the relationship between task characteristics and ability requirements, the reference battery was factor analyzed to identify a reference ability structure. The loadings of the various criterion task conditions on that structure were then estimated.

Of the five separate ability factors which were identified (suditory perceptual, flexibility of closure, associative memory, aspect of closure, induction) the auditory perceptual ability was found most related to criterion task performance and increased in importance as background noise increased and signal duration decreased. Thus these variations in task conditions produced changes in the degree of involvement but not in the patterning of the abilities required. Implications for predicting human performance are discussed.

Whitsett, D.A. The enriched job. <u>Personnel Administrator</u>, 1972, September-October.

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Enumerates three characteristics of enriched job: complete unit of work, worker has as much decision making control over work as possible, worker receives frequent direct feedback on his

Defines job enrichment as a strategy for designing or struc-turally altering jobs to provide the most interesting and fulfilling what possible for employees and to utilize the greatest amount of the amployee's competence and talent to achieve the most cost effective operation. Lists following problems of job enrichment

- Involves crossing of organizational boundaries and political disagreements over control.
   Increased training time and costs.
   Requires altered policies and procedures.
   Motivated workers become independent and hard to

Roomenic and business survival in the next 8-10 years will depend on making work more interesting and meaningful.

Whyte, W. P. Honey and motivation; An analysis of incentions in industry. New York: Harper and Brothers, 1955.

Purpose of book is to build a new model, socio-aconomic man, to replace discredited economic man who has held sway in incen-tive systems most common in industry today.

case material is presented, including data on individual and group incentive schemes and on plant organization. The incentive worker is examined in relation to his own work group and to management 'Part II), and the work group is analyzed in its instrumental and social relationships with other groups in the plant (Part II). These two sections are primarily focused on an analysis of individual piece-rate systems, while Part III is devoted to a consideration of the plant as a whole and to some plant-wide incentive systems, particularly the Scanlon Plan. Finally, generalizations drawn from the case studies are guiled together in the last section (Part IV), where a framework for studying economic incentives and human relations is formulated.

Author's descriptions of rate busters and quota restricters also indicate the importance of the workers' cultural hackgrounds. In his analysis, based on a group of workers working under a piecerate home system, he found that workers who were likely to be "rate busters" (produce above the group standards) were thone workers with rural or small-town backgrounds, whose fathers had been entrepreneurs of farmers, who were Protestants, who were Republicans, and who had tended to look "upward" toward their parents for authority sanctions rather than toward their per group. Questions to the process of the parents of the p

Miener, E. L., Training for vigilance: Repeated sessions with knowledge of results. <u>Ergonomics</u>, 1968, <u>11</u>, 547-556.

Two groups of subjects were run in a visual-monitoring test, one with knowledge of results (KR) providing instant feedback of correct responses, commissive errors, and missed signals, and the other with no knowledge of results (NRR). The groups were run for five-40-minute sessions on consecutive days, with a follow-up transfer session five weeks later. Results showed significant differences in detection rates between the groups on all five training sessions but not on the transfer session. Detection rates increased significantly during the five training sessions for both groups, and at approximately the same rate. Commissive errors were significantly different only in the first two training sessions with the IOR subjects showing more false alarms. Commissive errors did not increase or decrease over time within sessions, or over the five training sessions.

Wiener, E. L. On simultaneous monitoring and tracking. <u>Journal of Amplied Paychology</u>, 1975, <u>60</u>, 100-105.

Subjects (8 = 72) performed a visual monitoring task with no knowledge of results on the first day of a 2-day experiment. Two days later, they returned and were assigned to one of six groups, they performed the same task with or without knowledge of results under one of three levels of secondary task loads: high-frequency input compensatory tracking, low-frequency tracking, and no tracking. In addition, a seventh group (8 = 12) performed the tracking task only. Besults showed that time-sharing between monitoring and tracking degraded performance on both tasks, but tracking input frequency did not affect monitoring performance. Groups which received knowledge of results neither improved nor declined in monitoring perfermance when the time-sharing load was imposed.

Wild, R. Job needs, job satisfaction, and job behavior of woman manual workers. <u>Journal of Applied Psychology</u>, 1970, 54, 137-162.

Two thousand one hundred and fifty-nine female workers and 236 female ex-workers associated with several British electronics firms were given a forced-choice questionnaire and unstructured interview, to investigate their attitudes to various aspects of their jobs. Twenty-one percent of the present workers and 36% of the ex-workers expressed overall dissatisfaction with their jobs, which were of a highly rationalized type. An analysis of their responses indicated the overriding importance of the actual work done as a determinant of job dissatisfaction. An analysis of the response for leaving given by the ex-workers indicated that tolustary labor turnover resulted mainly from job dissatisfaction.

Wild, B. Work organization: A study of manual work and mass production: London, England: John Wiley & Sons, 1975.

The objective of the book is to examine present practice, trends and developments in certain aspects of mass production. The focus is on mass production of discrete items (e.g. care, appliances), and on assembly and manual work rather than a prolambatry such as chemicals.

Chapter 2 identifies basic types of mass production systems: must flow limes, individual and group assembly, sutematic or schemized assembly and transfer machining.

Chapter 3 reviews assembly lines in the Auto Industry and the Seab and Volvo experiments and the Lordstown disputes.

Chapter 4 examines the affects of mechanization and auto-mation on mass production assembly work. Case examples are given from Circuit Board Assembly, Vehicle Body Assembly and Electric Light Menufacture.

The balance of the book chapter concerns jcb restructuring and functional work groups. The appendix contains a tabular presentation of job restructuring projects involving assembly line work. The table includes a good review of European companies. Another appendix presents brief case studies from Volvo, Easb, Gearbox Assembly, Whickle Parts Assembly, Washing Machine Assembly, Television Assembly and Typewriter Assembly.

Wild, R., & Birchell, D. W. Job structuring and work organization. Journal of Occupational Psychology, 1975, 48, 169-177.

Reports results of survey of 49 European and American companies engaged in job structuring exercises and 40 experts. Comparisons are made to similar surveys (Roif & Scholerbek, 1966; Reif, Ferrasti, D. N., 5 Evans, R. J., 1974).

Operational issues (system output and changes) predominate as the major reason for undertaking job atructoring chances. For organizations stated as their primary objective the quality of work life or worker satisfaction. Outside experts state those

Survey results led to hypothesis of a three-stage life cycle model of change. Stage I is characterized by remedial motives (e.g., improved quality, reduced turnover and absentecism, improved, system flexibility). Stage 2 stems from organizational change and development. The scope of changes is broader and is motivated by a desire to adjust to and accommdate enternal social. sultural and political changes. Stage 3 is a combination of 1 and 2; a opposite amproach.

4.

wild, R., & Dewson, J. R. The relationship of specific job attitudes with ownell job satisfaction and the influence of brographical variables. <u>Journal of Management Studies</u>, 1972, 9, 150-177.

investigated influence of biographic characteristics (aye, marital status and length of service) on jeb attitudes and job satisfaction. Sample consisted of 2543 female manual workers unaged in unskilled repetitive work in 10 electronic plants in the United Kingdom. Attitudes toward eight features of jobs (work itself, supervision, induction, training, wages, social relations, management, and jaysical working conditions) were measured by a forced choice questionnaire.

Data was factor analyzed using a principle components analysis with orthogonal varimux rotation.

Major results were reported as follows: (1) self actualization attitude factor was most related to overall job satisfaction. This veriable accounted for over twice the criterion variance accounted for by any of the other joh attitudes. Age and rarital status had significant effects on the relationship of job satisfaction. The relationship of job satisfaction and self actualization, training, physical effort and conditions decreases while the relationship of pay to job satisfaction increases with increasing length of service. A general train showed that the extent of job satisfaction was less readily accounted for in terms of job attitudes of longer service employees.

Results suggest inadequacies in the global or general theories of job satisfaction and job design by indicating not only the need to consider the characteristics of workers in the design of jobs but also the possible need for regular redeployment of labor or redesign of jobs in order to maintain job satisfaction of current employees.

Wild, R., & Kempner, T. Influence of community and plant characteristics on job attitudes of manual workers. <u>Journal of Applied Psychology</u>, 1972, <u>56</u>, 106-113.

Used regression analysis to examine the relationships of the job attitudes of 2,543 female manual workers with the population characteristics of the 10 communities in which they were employed. Several suggested causes of job attitude-community relationships are also evaluated, in particular, the effect of certain plant characteristics. The relationships obtained relate mainly to workers attitudes to their pay and the nature of their work. The results suggest that workers from urban-type communities are better disposed to accepting rationalized and paced work than those from rural areas. Several of the attitude population relationships obtained are affected by within-plant characteristics. The results provide some support for the hypothesis that community factors affect workers job attitudes through the creation of a frame of reference within which judgments are made.

Williges, B. C., Johnston, W. A., & Briggs, G. E. Role of verbal communication in teamwork. <u>Journal of Applied Psychology</u>, 1966, 50, 473-478.

A simulated radar-controlled serial intercept task was used to examine verbal communication between teammates under verbal (communication necessary) and verbal-visual (communication necessary) and verbal-visual (communication necessary) conditions (E = 64 undergraduate males). Communication facilitated team performance only in the verbal condition. Team performance, however, was best in the verbal-visual condition. Team remarker-of-training paradigm was employed to determine if verbal stills developed in I condition would transfer to the other condition. Differential transfer occurred neither in communication behavior nor in team performance. It was concluded that verbal communication, when not required by the task, plays an insignificant sele is teamwork, and that this role apparently is not enhanced by verbal training.

Williges, R.C., & Morth, R.A. Knowledge of results and decision making performance in visual monitoring. <u>Organizational Schavior and Human Performance</u>, 1972, <u>B</u>, 44-57.

Investigated the role of knowledge of results (KR) on decision making performance in a simple visual monitoring task in which 5s were required to detect aperiodic, long-duration brightness changes and ignore short duration change. The experiments demonstrated the characteristic decrease in percent of signals detected over the watch period when KR was not given. In addition, the results of each study were analyzed in terms of the Theory of Signal Detectability. Experiment I resulted in significant changes in log B and d' when cumulative total events KR and cumulative detect response KR were provided (H=24 male students). Experiment If factorially compared the effects of cumulative total events KR, correct detection KR was effective in increasing d' ever the monitoring session. The implications of the results of each study were disquessed in terms of a decision making point-formance is complex and depends upon the specific type of KR presented.

Williges R.C., & Streeter H. Display characteristics in inspection tasks. <u>Journal of Applied Psychology</u>, 1971, 55, 173-125.

Eight imagector were required to detect pin-hole defects in a visual scanning task. Display type 'static vs. dynamic) and display arrangement rendom vs. ordered) were combined factorially in a withing design. Static 'imagector-paced) displays yielded more defect detections and fewer false alarm errors: whereas, display arrangement did not effect detections or false alarm errors. It was concluded that inspector-paced displays seem to be more beneficial than externally paced displays when rapid scanning rates are required. When inspectors are required to imspect at a rapid rate they do so at the expense of increased errors and fewer detections overall.

Wilson, G. D., Tunstall, O. A., & Eysenck, H. J. Measurement of motivation in predicting industrial performance. <u>Occupational Psychology</u>, 1972, 46, 15-24.

Previous attempts to measure work-related motivation, or 'drive', have been largely unsuccessful. Questionnaires are readily fakeable; projective techniques are cumbersome and display little evidence of reliability or validity. This paper discusses some hypothesised psychomotor and verbal learning indices of drive and outlines an investigation designed to evaluate them against conventional methods in an industrial setting. A measure of 'involuntary rest pauses' based on a brief tapping task was found to be a stable and fairly valid measure which appears suited to industrial use.

Wofford, J.C. The motivational bases of job satisfaction and job performance. <u>Personnel Psychology</u>, 1971, 24, 501-518.

Research study designed to investigate the motivational bases of job satisfaction and performance. So consisted of non-managerial workers from four companies (58 white collar employees of Airplane Parts Mfg. Co., 33 white collar employees of Medical Laboratory, 60 white collar employees of Partoleum Company & 56 blue collar employees of Warehousing Company). Sample completed Likert type job satisfaction scale, need gratification index, expectation index (degree to which employee expected performance to result in need fulfillment) and critical satisfaction incidents. Job performance was based on supervices rankings.

Results of study provide general support for the expectancy theory of job satisfaction and job performance.

Results did not support Maslow's theoretical position that lower level needs must be estisfied before upper level once become active. Opper level needs were found to be significantly related to job satisfaction for employees whose lower level needs were not gratified as well as for those whose lower level needs were gratified.

Author reports that the replication of Mersberg's critical incident research yielded similar results but did not support Mersberg's two factor theory if the data is analyzed in terms of employee responses instead of item by item. Concludes that empectancy theory holds more premise than Maslew's or Mersberg's theory.

No. If, N. G. Meed gratification theory: A theoretical reformulation of job satisfaction/dissatisfaction and job motivation. Journal of Applied Psychology, 1970, 54, 87-94.

Proposes a theory of job motivation based on Maslow's hierarchy of needs which will account for all the discrepant research results concerning job satisfaction. The theory differentiates between job satisfaction/dissatisfaction as end states and job motivation as a force to achieve an end state. It is theorised that Hersberg's content and context elements are related to both satisfaction and dissatisfaction in terms of the level of gratification of the various needs within Maslow's hierarchy. It is further theorised that job motivation results from an individual's perception of the relationship between specific job-related behaviors and desired need-gratifying consequences. Context elements are interpreted as being unlikely to be perceived as leading to increased gratification of active needs through job-related behaviors, while content items are likely to be so perceived.

Mollack S. The effects of work rate upon job satisfaction. Unpublished Phd.dissertation. Bowling Green State University 1969.

Study of forty workers hired to serform either an assembly or inspection took. After a 4 day learning period a base rate was catablished for a workers preferred rate of work. On the fifth work day each subject was easigned to a complicory rate based upon his preferred rate. Questionsire data resoured job satisfaction, fatique and borodom. The hypothesis that an inverted U relationship between work rate discrepancies and job satisfaction was not confirmed. However when perceived work rate rather than actual rate was used in the analysis the hypothesis was confirmed. Discrepancies between perceived work rate and above mormel actual work rate wase associated with fetique while discrepancies below normal rates were associated with bereden.

Ressures of perceived work rate were found to be only mederately correlated with actual rate of work. However a statistical interaction between satisfaction and actual and perceived rate was found. Coupality cannot be inferred from data.

Wollack, S., Goodale, J.G., Wijting, J.P., & Smith, P.C. Development of the Survey of Mork Values. <u>Journal of Applied Psychology</u>, 1971, <u>55</u>, 331-338.

Reports on development and construction of Survey of Work Values (SMV). Survey is based on following intrinsic and extrinsic dimensions of the Protestant Ethic: Pride in work, job involvement, activity toward earnings, social status of job, revard striving, and responsibility to work. The content validity of the items was established by the reallocation method of scaling. Items were analyzed to determine scoring and selection of items for the subscales according to the internal consistencies and factor independence of the subscales. Responsibility to work was eliminated. The final form of the SMV consists of six subscales each containing nine items rated on a 6 point Likert scale. A discriminant analysis, using five occupational groups (M-449) ranging from unskilled employees through professionale established that the subscales could discriminate. Following biographic factors were related to SMV subscale scores using employed and disadvantaged Ss: Sem, race, education, urban-rural and amount of police trouble.

Wood, D.A. Enhancing attitude-performance relationships by degree of job involvement. <u>Proceedings of The 79th Annual Convention American Psychological Association</u>, 1971, §, 495-495.

Evaluated job involvement as a moderator of job satisfactionjob performance relationship. Sample consisted of 41 female machine
operators. Job involvement was measured by a seven item 5 point Likert
scale. Righ and low job involvement groups were formed by dividing
at the mean. Job satisfaction was measured in 10 different extrinsic
or intrinsic areas by one item jet question. Performance was measured
by supervisors ratings and actual production score. Using the total
sample the r's between attitude on ten items and performance were non
significant (r-.24 to .21). Dichotomizing the groups lith high and
low job involvement resulted in significant relationships. Low job
involvement group was younger, lower in seniority, had more education,
was somewhat less productive and less satisfied than high job involvement group. In low job involvement group significant positive r's
were found between job satisfaction, extrinsic factors (wayes, and
company) and actual production. In high job involvement negative
correlations were found between intrinsic factors and actual production (recognition and edvancement). Concludes that workers low in imvolvement are more satisfied extrinsically as productivity increases.
While those high is involvement are more dissatisfied as production
increases.

Wood, D. A. Effect of worker orientation difference on job attitude correlates. <u>Journal of Applied Psychology</u>, 1974, 59, 54-60.

Examined correlations between various worker attitudes and job motivation, performance, and absentecism for 290 skilled and semiskilled papermakers. The hypothesis that significant relationships occur more frequently for those employees least job involved was supported, inasmuch as they accounted for 84% of the significant correlations. Further analyses disclosed twice as many associations for skilled as for semiskilled employees. Thus, highly involved employees, more intrinsically oriented toward their job, did not manifest satisfactions commensurate with company evaluations of performance; they depended more on intrinsic rewards. Those employees more detached from the job itself where more extrinsic in orientation and experienced gratifications more in line with company performance assessments due to their greater dependence on extrinsic rewards.

Woodword, J. <u>Industrial organization: Theory and practice</u>. London: Onford University Press, 1965.

Contains the full report of an empirical study of management ergenization in 100 firms in South Essex. The book is divided into three parts. Part I describes the survey of 100 out of 110 firms in Senth Essex with more than 100 employees. Part II outlines less detailed cases studies carried out with 20 firms with over 250 employees and three intensive studies of firms with mixed or changing technologies. Part III deals with follow-up investigations and a consideration of the problems and effects of change.

The author derives her technology variable from the production system and, for the purposes of analyzing the results, eleven entegories of production method are reduced to three, unit and small batch production, large batch and mass production, and process production. The chief results of the survey show how the variability among firms with respect to such organizational features as number of levels of management, percentage of the firms total turnover allocated to wages, and the numbers of employees controlled by the first line supervisor is linked with technology and is not only a function of leadership behavior. The chapter in which technology and organization are related to the success of the firm is less convincing. By 'topping and tailing' on success, derived from a variety of criteria, we end up with only if firms in the analysis. The results suggest that the successful firms in each production category may stand out from the others in that they tend to cluster round the median of their category on figures relating to organizational characteristics.

After emplaining the methods used in the case studies, Miss the Court goes on to outline a reclassification of organisation beased on eareful definitions of terms such as line, staff and function. In the case of the last she draws distinctions between 'took' and 'element' functions. Task functions, such as marketing, have specific and definable and require which element functions, like personnel, do not.

The case studies provide a wealth of interesting data. For example, in one chapter the main aspects of the manufacturing cycle (development, production, marketing) are isolated and it is argued that the importance of each aspect vis à vis the other two varies from one technology to another. In a later chapter we find that change causes the greatest stress in the middle range of technologies particularly where the production system is moving into batch production. As one reads through the book two important trends become discernible. Firstly, there is a growing realization that the relationship between organization and technology is more complex than was originally thought. It is this complexity which calls for greater sophistication in the instruments of measurement. Secondly, and this is inevitable in the shift from survey to case study material, increasing attention is paid to the part played by individuals.

Woodward, J. <u>Industrial organization: Behavior and control</u>. London: Oxford University Press, 1970. (a)

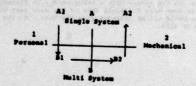
Description of seven case studies of differing industrial organisations conducted by research workers sponsored by the Imperial College, London. The theoretical framework derived from these studies, enalysing the behavior of industrial workers at all levels, under the constraints imposed by their various industries, is elaborated in the first part of the book. In the second part, the contributors illustrate that framework by reference to their case study data. Finally the material collected, and ideas generated by the research team, are summarised.

Moodward, J. Technology, material control, and organizational behavior in A.R. Megandhi & J.P. Schwitter (Eds.), <u>Organizational</u> <u>Behavior Models</u>. Rent, Ohio 1970. Dureau of Economic and Dusiness Research, College of Business Administration. (b)

Discusses the study of 100 firms in the South of England and the conclusion that technology influences the functions and character of menagement.

Proposes a typology of organizational behavior based on the division of behavior into constrained, facilitated, or reactive.

Also proposes a classification of control systems based on the combination of the two parameters of personal/machanical and single/multi spectrums of control,



Firms go from Al to Bl to B2 and then to A2 as their technology progresses and the fire Eross.

Wool, R. What's wrong with work in America? - A review essay. Honthly Labor Review, 1973, 36, 38-44.

Evaluates task force report on Work in America (1) in area of increased worker dissatisfaction. Wool reports that numerous surveys have indicated that only approximately 20% of work force is dissatisfied and that trends on increasing dissatisfaction can not be discerned from surveys. Evidence on trends in labor turnover, absenteeism, strikes, productivity, and labor force participation indicates little objective evidence to support an inference of rising worker discontent. Argues against Maslow-Hersberg model of work aspirations in that it fails to take into consideration inflation and economic security. Workers with family commitments are still not in a position to make a tradeoff of entrinsic rewards in favor of meeting their intrinsic needs.

Concludes that we need a national commitment to a maximum employment policy. Notes that job design project have been most evident in countries such as Sweden and West Germany which have lower ratios of peacetime unemployment than in the U.S. and that these job enrichment prejects have been initiated in precisely those industries which have most acutally felt a labor chortage situation.

(1) Work in America: Report of a special tack force to the Secretary of Health, Education, and Welfers, Cambridge, Mass. MIT Press, 1973.

Wyatt, S., Fraser, J.A., & Stock, P.G.L. The comparative effects of variety and uniformity in work. Report No. 52, 1929, Industrial Patigue Research Board, 'a)

Syntt, S., Preser, J.A., & Stock, P.G.L. The effects of monotony in work. Report Bo. 56, 1929, Industrial Patigue Research Board. 'b)

Pystt, S., Langdon, J.B., & Stock, P.G.L. Patigue and boredom in repetitive work. Report So. 77, 1937, Industrial Putigue Research Deard.

Early studies of effects of the uniform work conditions, and cycle time and the effects of fotique and boredom on resettive work. Three early studies concluded that boredom was associated with a decline in work rate and productivity. It was also concluded that boredom and monotomy were greatest in the middle of the day.

Yorks, L. Now elements in implementing job enrichment, <u>Personnel</u>, 1973, <u>50</u>, 45-52.

Defines job enrichment as providing the worker with a job that has three characteristics: complete piece of work, decision making responsibility and control over work, and direct feedback through the work itself.

Implementation of job enrichment should be based on a consulting rather than a training model, and should be coordinated by a key man in a line position who is charged with building job earlichment into the department on a permanent basis, and commands the resources, knowledge and authority to do on.

Simmeruan, W. S. The influence of item complexity upon the factor composition of a spatial visualization test. <u>Educational and Exechological Measurement</u>, 1954, 14, 106-119.

Three forms of an AAF emperimental test, Visualization of Rancuvers, were factor analyzed to determine their comparative factor structure. It had previously been hypothesized that a variation in factor pattern could be demonstrated among the three forms which would show four factors (Porceptual Speed, Space, Visualization, and Reasoning) on a continuum of difficulty and complexity. The results of the analyzes supported the hypothesis for the first three factors but not for the fourth. The easier, here speeded form of the test gained by for the highest loading on Perceptual Speed, the test of medium difficulty led the others on Space, although not as convincingly, and the most difficult of the three led the others with a heavy weight in Visualization. Whather an even more difficult form of the same test would sample Reasoning could not be inferred from the data. If size varied from 214 to 8158.

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Ability General trait of individual which has been inferred from certain response consistencies on certain kinds of tasks (Pleiahman, 1966).

Activation Theory Individuals adapt to a certain level and pattern of environmental stimulation. Deviations from this adaptation level produce sither pleasure reward or distress depending on the size and nature of the deviation (Scott, 1966; Fiske & Maddi, 1961).

Alienation A continuum running from integration to alienation with middle-class sorms. At the integrated and of the scale are workers involved with their jobs who have upward mobility goals. At the opposite pole, workers are only instrumentally involved in their jobs (Slood & Mulin, 1967).

Alienation or level of self-estrangement is positively related to lack of control over the immediate work processes (power-lessness), performance of narrow work role due to task spe-cialization (meaninglessness), and lack of opportunities for promotion (Kirsch & Lengermann, 1972).

work elienation results from three veriables: meaninglessmess (inability of individual to relate his contribution to
entire work process), powerlessness (lack of control over
job), and normlessness (lack of feeling of belonging to a
cohesive work group) (Suman, 1972; Blauner, 1964).

Assembly Line Syndrome Technological variable identified by factor analysis of interviews with workers in an auto and electronic assembly plant. The variable includes physical strain,
time pressure, quality-quantity conflict, repetitiveness and
other features of a paced job (Lodah), 1964).

Associated Task Attributes (ATA) Judges' rating of task identity,
cycle time and working conditions on nine-point scales
(Turner & Lawrence, 1965).

Alighbute Prairyance Scale/Atvribute Description Scale (APS/ADS)
An instrument designed to measure two basic variables, workers'
preferences for job attributes and workers' descriptions of
their current jobs, as applied to Havel monitoring and maintenance tasks. The attributes most critical to monitoring
that are included are warlety, independence, responsibility,
and job complexity, while those for maintenance tasks include
variety, closure, independence, and learning new skills.
The subject is presented with 16 job descriptions for each
task and the amount of each attribute represented in the job
descriptions is varied. By responding to these descriptions
the agreement/discrepency between preferred and described job
attributes can be obtained (Barrett, Bass, O'Commor, Alexander,
Forbes, & Cascio, 1975).

Attribute Requirement Inventory (ARI) is a 103-item inventory
related to the work elements of the Occupational Analysis

the agreement/discrepency between preferred and described job attributes can be obtained (Barrett, Base, O'Commor, Alemander, Foodbes, & Cascio, 1973).

Attribute Requirement Inventory (ARI) is a 103-item inventory related to the work elements of the Occupational Analysis Inventory (OAI). The ability categories are: (1) general wocational, (2) cognitive, (3) psychomotor, (4) sensory, (3) interests, and (6) needs (Neeb, Cunningham, & Pasa, 1974).

Matenamys Mork Groups These are groups into which elements of supervision, control, and sutual sasistance are incorporated in group-jobs. As a member of a group, the worker has a nhare in a wider task. Essential requirements for such a group are that the group-job should be clearly defined, and that the results should be fed back to the work-group or the worker, preferably to both (Engelstad, 1970; Phillips, 1968).

Palance Delay Time Idle time in an assembly line resulting from differences in work time assignments between operators (Conant & Kilbridge, 1965; VanBeek, 1964; Kilbridge, 1960s).

Manh Building Morking Up the Line Building up a reserve of material or working shead so the worker has a break or rast period.

Also called working shead of station (Belbin & Stammers, 1972).

Patch Work units of one to two hour duration as compared to an operator or sgroup of operators or removed after processing at one time (Cox & Sherp, 1951).

Patch Sing The number of material units of production issued to an operator or a group of operators or removed after processing at one time (Cox & Sherp, 1951).

Patch Asserbly Job enrichment procedure of removing assembly work from a progressive assembly line to a single work station or bench (Conant & Kilbridge, 1965).

Patch Sing The number of material units of production issued to an operator or a group of operators or removed after processing at one time (Cox & Sherp, 1951).

Patch Sing The concept seponle share shout an organisation. As concepts, climate perceptions are meaningful abstractions of sets of cues, the cues has the man

(2) Conventional Longwall - Mcchanized coal mining using coal cutters and conveyors manned by work crews of 40 men split into 14 or more separate tasks apread over 3 shifts.

(3) Composite Longwall - A mining method where the workers form themselves into one whole group with all members jointly responsible for all activities, thus resulting in a multiskilled group. This method is mechanized. (Trist 6 Bamforth, 1951; Trist, Higgin, Murray, & Pollock, 1963). Tethonsive Set of Occupational Data Analysis Programs (COMP) Consists of series of interreleted computer programs design for analysing and retrieving occupational survey information collected by job task inventories (Carpenter, 1974; Watson, 1974).

tion collected by job task inventories (Carpenter, 1974 Watson, 1974). <u>straint</u> Bestriction of physical movement, lack of control over work process, work hours, work environment (Stagne

Content Factors (Job) Motivation factors or intrinsic job features including achievement recognition, interesting work, responsibility and opportunity for advancement. These factors can lead to heightened motivation (Merzberg, 1964, 1966, 1968).

Content Factors (Job) Extrinsic or hygiene job features such as supervision, co-workers, salary working conditions, company policies and practices according to motivation-hygiene.

Problems with these factors cause dissatisfaction. Improving hygiene or context factors will remove dissatisfaction but mot increase motivation (Merzberg, 1964, 1966, 1968).

Cyrle Time Amount of time required to start and fully complete a job. A longer cycle of work may present a greater warkety and task difficulty to the worker (Belbin & Stammers, 1972, Hill & Thickett, 1966).

Entropy A measure derived from information theory which represents

Entropy A measure derived from information theory which represent the proportion of the work period devoted to a task. Entro by allows for a weighting of the number of tasks performed by duration (Hill, 1969, 1975)

by allows for a weighting of the number of tasks performed by duration (Mill. 1969, 1975)

Exclancy Effect Result of a field study or experiment is not a function of the experimental treatment or manipulation but of the expectation of the experimenter or manager which is subtly conveyed to the worker or subject (King, 1974).

Dectancy Theory, Strength of a tendency to act in a certain way depends on the strength of an expectancy that the act will be followed by an outcome and on the value or attractiveness of that outcome. Rackman and Lauler (1971) have extended expectancy theory to job design by the following propositions designed to enhance worker motivations (1) Outcomes must be valued by the indisfers and can include instrinsic and extrinsic outcomes.

(2) Outcomes are valued by an individual if they satisfy the physiological or psychological needs of the individual.

(3) Conditions should be arranged at work so that workers can satisfy their needs best by working effectively toward organizational goals.

(4) Basic lavel needs are satisfied by contemporary society and do not serve an motivators.

and do not serve as motivators.

(5) Individuals who desire higher order need satisfaction will respond favorably to jobs with responsibility meaning and feedback. Higher order need satisfaction is a result of effective performance and an incentive for continued

will respond favorably to jour wash superioristic and seedback. Higher order need satisfaction is a result of effective performance and an incentive for continued performance.

Intrinsic Job Orientation A characteristic orientation of the individual whereby in describing his job he would tend to emphasise the environment within which it was performed, security, and supervision (Saleh, 1971e, 1971b, 6 1971c; Saleh & Grygier, 1969).

Institute the Crysier, 1969).

Institute Loops Formal reporting structure through which employees receive knowledge concerning their performance (Davis & Walfer, 1965).

Institute the Crysier in the supervisor's job in the direction of including authority and responsibility for all of the functions required to complete the product or service assigned to his work group, including quality acceptance.

Functional Specialization The systematic way in which the technical operations of man and machines are assigned to individual employees as work tasks, also referred to as division of labor (Shepard, 1969).

Seal Setting This involves the process of dutermining behavior that is defined by the qual to be reached rather than by the responses necessary to reach it (Locke, 1967, 1968).

Seal Setting This involves the process of dutermining behavior that is defined by the reach a production quota. Putting forth only minimal effort (Roy, 1951, 1952).

Seal Setting The Indianal Section of the Seal Section of Seal Section Section Seal Section Section Seal Section Section Seal Section Section Section Seal Sectio

Bigh Task Index Jobs Jobs with high Requisite Task Attributes
(RTA) scores which consist of a weighted total score of the
variety, autonomy, learning time, responsibility required,
interaction and optional interaction of a job. See Requisite
Task Attributes, (Turner & Lawrence, 1965).

Task Attributes, (Turner & Lawrence, 1965).

Bigher Order Needs or Hierarchial Classification of Needs A theory of needs postulated by Maslow. Needs are arranged on five levels (physiological, safety, love, esteem, and self-actualization). Lower level needs must be met or satisfied prior to the emergence of higher order needs (Maslow, 1943, 1965; Hackman & Lawler, 1971; Manous, 1973, 1974).

Horizontal Dimension Refers to the number and variety of the operations that an individual performs on the job (Lawler, 1969, page 430).

Horizontal Expansion Increasing the number of tasks a person does which is often referred to as job enlargement (Lawler, 1973, page 152).

Horizontal Expansion Increasing the number of tasks a prison does which is often referred to as job enlargement (Lawler, 1973, page 152).

Borizontal Nob Enlargement The meaningful addition of similar operations to provide a complete work module for a worker or small team of workers (Gifford, 1972, page 42).

Borizontal Job Logding An activity that merely enlarges the meaninglessness of the job (e.g. challenging the employee by increasing the amount of production expected of him; adding another meaningless task to the existing one; rotating the assignments of a number of jobs that need to be enriched; removing the most difficult parts of the assignment to accomplish more of the less challenging assignments) (Herzberg, 1966, page 59).

Hygiene Factors (See Context Factors)

Index of Community Characteristics Consists of the following values of community characteristics: slums, prosperity, productive farming, unemployment, decrepitude, and northern work force. The first three variables were intended to index the general economic situation of the community. Unemployment was included to index job opportunities in the community. The last two variables were included for general interest value (Mulin, 1966s).

index the general economic assection of the community. The last two variables were included for general interest value (fiulin, 1966a).

Individual Job Design Workers at individual work stations secure materials, assemble the entire unit and are responsible for final inspection (Marks, 1954; Davis & Canter, 1956).

Industrial Democracy This concept refers to a program in which workers join with management in improving the quality of the work environment and productivity. The objective of the industrial democracy approach is to humanize the work-place through a joint, cooperative, and constructive effort by management and labor (Adizes, 1971; Blum, 1953, 1968).

Industrial Man Hypothesis Workers from different social and cultural backgrounds adapt readily to industrial society. This view is in opposition to the developmental view that adaptation weries according to the stage of industrialisation (form, 1971).

Integration Extent to which people perceive themselves as isolated or linked together through interaction (e.g. relationship with fellow workers, relationship with first line supervisors, labor management relations, status structure, and evaluation of the company) (Fullan, 1970).

The process by which subsystems of organizations are brought together resulting in units of a higher order; coordination of subsystems (Lawrence & Lorsch, 1967a, 1967b). Intrinsic-Extrinsic Mork Values A questionnaire derived from factor analysis that measures the following three factors:

(1) Extrinsic job aspects, (2) Intrinsic job aspects, and (3) Recognition through advancement. (Friedlander, 1963; Robey, 1974).

Intrinsic Job Orientation A characteristic orientation of the individual, whereby in describing his job he would tend to emphasize its actual performance and the challenges and accomplishments of the job (Saleh, 1971a, 1971b, 1971b; Saleh & Grygier, 1969).

Intrinsic Peward A reward inherent in the task derived from interest in the task or pleasure in performing the task (Hammer & Foster, 1975).

Job Activity Preference Questionnaire (JAPQ) Interest inventory

interest in the task or pleasure in performing the task (Hammer & Foster, 1975).

Job Activity Preference Questionnaire (JAPQ) Interest inventory which parallels the position analysis questionnaire (PAQ) and consists of 150 of the 187 items on the PAQ. Divided into the same six work activities, worker indicates his interest in having certain activities as part of his job (Mecham, Harris, McCornick & Jeanneret, 1972).

Job Attitude Scale (JAS) A measure of intrinsic-extrinsic work orientation consisting of 120 items involving 16 statements, each being paired with the other 15 in a forced choice format. Six of the statements represent the following intrinsic factors: achievement, advancement, growth in skill, nature of work, recognition, and responsibility. The other 10 represent extrinsic factors and include: company or organizational policy; interpersonal interactions with supervisor; subordinates and equals; salary; salary needs for family's sake; security, status; technical supervision; and working conditions. The subject indicates in each of the 120 items of the scale which of the two factors (either extrinsic or intrinsic) will be more satisfying to him in the performance of his job (Saleh, 1971b).

Job Component Validity The statistical estimation of aptitude requirements and/or compensation rates for jobs on the basis of job analysis data (McCornick, 1974).

Attention The extent to which the job requires complete attention or concentration on specific activities, operations, or processes.

- C. C.

antonomy The independence a person has in the performance of his respective task. Self regulation of work content, structure, methods, goals, and objectives

The extent to which employees have a major say in scheduling their work, selecting the equipment they will use, and deciding on procedures to be followed (Rackman & Lawler, 1971).

The degree to which the job gives the worker freedom, independence, and discretion in scheduling work and carrying it out (Mackman, Oldham, Janson, & Purdy, 1975).

Closure How much a job allows a person to keep at the job until it is finished.

until it is finished.

Complexity How much information has to be dealt with in order to perform the job.

Decision-Making The degree to which you have to interpret uncertain information in order to do the job.

Demondence (Task) Extent to which a task influences or depends on other tasks in the same work system.

(Cooper, 1972).

Difficulty How long it took to learn to do the job well.

Degree of complexity of the search process in performing the task, or amount of thinking time required or body of knowledge required to perform task (Van de Ven & Delbecq, 1974).

Piscretion Anount of decision-making on part of worker on whether to perform a task, how to complete a task and the order of completing a task (Bell, 1966).

task and the order of, completing a task (hell, 1966).

Morkers' actual or perceived discretion in things like personal thoughts, communications, rollef opportunities, work variety, physical movement, work speed, slack time and attention requirements (Taveggia & Hedley, 1974).

Piscretion - Mork Participation Choice of job, choice of whether to work or nut work. This is a measure of perceived discretion available in larger institutions of work (Taveggia & Hedley, 1974).

Piscretionary Jobs A job can be viewed as permitting discretion if any of the last three digits (dats, people, things) of the occupational code number from DOT is 458 or lower. If a job is coded 556 or higher it is so routine and lacking in challenge that discretion is impossible (Brown, 1975).

Feedback Degree to which a worker gets information about the effectiveness of his performance (Hackman, Oldham, Janson, & Purdy, 1975).

Redback - External Now much information you get from others about whether you have done a good or bad job. Peedback - Internal The degree to which you know if you have done a good or bad gob. Peedback - Knowledge of Results Practice of providing information reperding the correctness, accuracy or quantity of response or work behavior (Locke & Bryen, 1969s, 1969s; Higliore, 1970).

Peedback - Transformation Feedback or perceived effects of operations on atimulus material of a task (Cooper, 1972).

Ool Clarity The extent to which you know exactly what to do at all times.

to do at all times.

Goal Recognition A worker's understanding of the relationship of each individual task o the owerall goals of the organization (Lehrer, 1958).

Goal Structure Clarity of goals and degree of goal attainment (Ccoper, 1972).

Identity (Tank) The degree to which the job requires completion of a whole and identifiable piece of work-doing a job from heginning to end with a visible outcome (Hackman, Oldham, Janson, & Purdy, 1975).

Independence (Methods) How much choice you have about how to do a task.

Independence (Pace) How much you can act independently to set your cwn pace.

Independence (Sequence) How much you can act independently to decide what order you are going to do your own work.

to decide what order you are going to do your own work.

Interpersonal (Dealing With Others) The degree to which a job requires employees to deal with other people (either customers, other company employees, or both) to complete the work (Mackman & Lawler, 1971).

Interpersonal (Friendship Opportunities) The degree to which a job allows employees to talk with one another on the job and to establish informal relationships with other employees at work (Mackman & Lawler, 1971).

Interpersonal (Optional Interaction) Now much freedom you have to make friends with other workers while you are on the job.

Interpersonal (Required Interaction) Now much you must deal with other workers in order to do your job.

Interpersonal Relations (Bubordinates) Now well do you get along with your muddies.

Interpersonal Relations (Subordinates) Now well do you get along with your muddies.

Interpersonal Relations (Supervisor) How well do you get along with your supervisor.

Job/Organization fit The extent to which the job fits into the total organizational picture.

Job/Ferson fit The extent to which you are naturally suited for this job.

Jearning New Skills (Necessity) How such the job requires you to learn new skills.

Jearning New Skills (Opportunity) The extent that the job provides the opportunity to learn new skills.

Order The degree to which there are regular times and weys for doing things.

Order The degree to which there are required for doing things.

Pay The extent to which you are equitably paid,

Physical Effort and Movement How much physical effort and movement the job requires from the worker.

Physical Morking Conditions are the physical working conditions comfortable?

Policy and Administration How well the organization is run and how teir it is to its personnel.

Passgurces [Availability] This degree to which supplies, equipment and information needed to do the job are readily available.

run and how feir it is be responsed.

Perpurces. (Availability) The degree to which supplies,
equipment and information needed to do the job are
readily available.

Perpurce of the property of the perpurchance of the performance of a number of different activities or operations.

Is a function of the number of different tasks performed the performance of the perpurchance of the perpurchance of the perpurchance of the perpurchance of the perpurcha

Is a function of the number of different tasks performed and the discretion level of the job (Bell, 1966).

Is provided in work by variations inherent in operations, tasks, batches and changes of job as well as discretion over work pace and other factors. Variety may be associated with changes in operation, task or activity (Dickson, 1973).

The degree to which a job requires employees to perform a wide range of operations in their work and/or the degree to which employees must use a wariety of equipment and procedures in their work (Nackman & Lawler, 1971).

Is a function of time drag. Overestimation of time is greater in variety type jobs and long cycle jobs (Kerr & Keil, 1963).

Technological variable identified by factor analysis of interviews with auto and electronic assemblers. Variable included mental ability required, opportunity for interaction, relief vs. line worker, and intrinsic job satisfaction (Lodahl, 1964).

Yariety (Physical) Number of people available for inter-action, variety in physical location of work, and & gree to which continuous mental attention is required (Cooper, 1972). Variety (Skill) Task and response uncertainty (Cooper, 1972).

The degree to which s job requires the worker to perform activities that challenge his skills and shilities.

(Macksam, Oldham, Janson, & Purdy, 1975).

Bork Scheduling The extent to which you feel the hours you work are reasonable.

A Perrintive Index (JDI) A S-factor scale (psy, promotion, work itself, supervision, co-workers) (Smith, Rendell, & Mulin, 1969).

A Perion The organization of a job to estisfy the technical-organizational requirements of the work to be accomplished and the human requirements (Savis, & Center, 1955, page 3).

As Diagnostic Survey (JDS) Measures four separate areas:

(1) Job Dimonsions - skill variety, task identity, task significance, autonomy, (sedback from agents, feedback from job itself, dealing with others. (2) Experienced psychological states - meanagfulness of the work, responsibility, knowledge of results. (3) Affective responses to the job - queersl satisfaction, internal work motivation, specific satisfaction. (4) Individual growth need strength. Scales can be used to derive a motivating potential score for jobs. (Hackman & Oldham, 1974s. 1975).

\*\*Sob Bilargement\*\* An older term job enlargement should be avoided because it is associated with past failures stemming from a misunderstanding of the problem. Job enrichment provides the opportunity for the employees psychological growth, while job enlargement makes a job structurally bigger (Merzberg, 1968).

Process of ellowing individual workers to determine their own working pace (within limits), to serve as their own inspectors by giving them responsibility for quality control, to repair their own mistakes, to be responsible for their own machine setup and repair and to attain choice of method (Mulin & Blood, 1969).

Expension of job content to include a wider variety of tasks and to increase the worker's freedom of pace, responsibility for checking quality and discretion for method (Kilbridge, 1960a, 1960b).

Constitutes an increase in the variety of tasks performed by an employee for the purpose of reducing monotony and/or more fully utilizing the potential skills and capabilities of the individual and/or allowing the worker more freedom and responsibility in the performance of his job (Reif & Schoderbek, 1966).

schoderbek, 1966).
Enlargement or Extension Factors include number of tasks, variety of tasks, repetitiveness of tasks and length of job cycle (Simonds & Orife, 1975).

Enrichment Systematic attempt to restructure jobs with the objective of obtaining improved worker motivation (Anderson, 1970).

Concerned with designing jobs that include a greater variety of work content, require a higher level of knowledge and skill, give the worker more autonomy and responsibility for planning, directing, and controlling his own performance, and previde the opportunity for personal growth and . meaningful work experience (Lethans & Reif, 1974).

Factors include determination of work pace, work methods, responsibility for machine set up and repair, and amount planning (Simonds & Orife, 1975).

Strategy for designing or structurally altering jobe to contain three characteristics: (1) complete piece of work, (2) job incumbent has as much decision making control ower how he is to carry out task as possible, and (3) individual receives frequent and direct feedback on his performance. The purpose of job enrichment is to provide the most interesting and fulfilling work possible and to utilize the greatest amount of the employee's competence and talent to schieve the most cost effective operation (Whitsett, 1972).

Extension Consists of merely adding similar elements to the job without altering job content (Wulin & Blood, 1958).

Adding more of the same kind of tasks, "Kilbridge, 1960s, 1960s).

Involvement This concept refers to the internalization of the positive value of work and is related to satisfaction with intrinsic but not extrinsic job variables (Lodahl & Rejner, 1965).

with intrinsic but not extrinsic job variables (Lodahl & Rejner, 1965).

2. Involvement Scale Measure of job involvement. Scale consists of 20 items in a Likert type four category scale (Lodahl & Rejner, 1965).

2. Notivation Index A 144 item, five-point Likert type scale which assesses motivation orientation, hygiene orientation, and various other scores (e.g., hygiene available, hygiene deprivation) (Masson, 1971).

1. Trientation Inventory (2011) Ipsative scales measuring potential work reinforcers: A 45 forced choice questionnaire measures ten reinforcers: (1) schievement, (2) responsibility, (3) opportunity for personal growth, (4) recognition, (5) job status, (6) interpersonal relationships, (7) pay, (8) job security, (9) provision for family, and (10) support for hobbies (Blood, 1973).

2. Preference Survey 120 paired statement descriptive of 6 work interest components (e.g., routine-varied, indoors-outdoors) (Long, 1952).

2. Purification Jobs containing professional and non-professional elements or professional requirements at different levels of difficulty can be purified by removing the less demanding aspects of the job. New positions at lower grades than those undergoing purification are then established (Polisser, 1965, page 13).

2. Batting Type of Job Diagnostic Survey for supervisors and ostaids observers to measure objective characteristics of job (Meebson, 6 Oldman, 1974a, 1975).

- Job Reaction Survey A measure of the effects of job enrichment on the perception of motivators on the job. The survey consists of 16 statements rated on a six-point
- scale (Masson, 1971).

  Otation Periodic reassignment of workers to new or different jobs.

- scale (Masson, 1971).

  Job Rotation Periodic reassignment of workers to new or different jobs.

  Job Scope A combination of four core dimensions (variety, autonomy, task identify, and feedback) rated on a seven-point scale (O-low degree of core dimension, 7-high degree). (Stone & Porter, 1973, 1975).

  Job Simplification Results in jobs requiring less skills which are more repetitive and have less autonomy (Hulin & Blood, 1968, page 42; Swain, 1973; Uris, 1965).

  Joint Optimization A strategy of choosing a form of task organization which jointly optimizes the technical and social subsystems of the enterprise. This involves an organization which simultaneously meets the technical requirements of the task and satisfies important human needs, especially the need to belong to a primary task group with a meaningful set of objectives (Miller & Brier, 1967).

  Line Job Hesign Each worker performs a specialized operation at a work sation spaced along a conveyor line (Marks, 1954; Davis & Canter, 1956).

  Jords Canter, 1955).

  Jords on Syndrome This refers to a general situation in which younger workers are rebelling against production speedups, the monotony of the assembly line, and the lack of freedom (Business Meek, 1972b).

  Management by Chiestima Involves organization strategies to set up goals divided into three categories: (1) regular objectives, (2) problem solving objectives, and (3) innovative objectives to decentralize organizations, to ordenign reward systems, and to develop supportive managerial behavior to recove obstacles to performance (O-lionen, 1975).

  Mass Production Involves four characteristics: (1) high degree of task repetitiveness, (2) minimum skill requirements for workers, (3) standardization of tools and techniques, and (4) minute subdivision of product worked on (Malker & Guest, 1952).

- A generic rather than specific term. Large output or quantity of production achieved by the invention and availability of mechanized methods of production. In addition to quantity of production, mass production can involve the flow of products through or past a series of production facilities (Wild, 1975).

  Natrix Organization One in which the integrating role acquires increased power through the establishment of a dual reporting relationship. That is, at some level of the organization, a manager becomes a member of both the resource department and the product or program office (Walton, 1975).

  Ninnesets Joh Deceription Questionalize (NFOC) Measures the reinforcer characteristics of occupations. The MJDO employs the method of multiple rank orders for ranking the relative strength of 21 occupational reinforcers. Statements describing the reinforcers are presented in groups of five and are ranked according to how well they describe the job (ranks range from 1, most descriptive, to 5, least descriptive) (Tinsley & Weiss, 1971).

  Ninnesots Joh Requirements Questionnaire (MJEM) Represents the dimensions of the Central Aptitude Test Rattery (GATB) in operational ability terms. The n-ne abilities of the GATB-General (0), Verbal (V), Num erical (s), Spatial (S), Form Perception (P), Clerical Perception (O), Motor Coordination (R), Finger Dexterity (F), and Manual Dexterity (M) were each represented by five items. Such item was rated, using a Likert format, in terms of the importance which the described ability has for successful job performance (Desmond & Weiss, 1971).

  Minnesots Occupational Classification System (MCS) Classifies occupations according to aptitude patterns and occupational
- (Desmond & Weiss, 1971).

  \*\*Inness's Occupational Classification System (MOCS) Classifies occupations according to aptitude patterns and occupations reinforcers which result in clusters of occupations (See Taxons). Occupational reinforcers include achievement, security, and responsibility (Lofquist, 4 Dawis, 1969; Dawis, & Lofquist, 1975).
- Dawis, & Lofquist, 1975).

  Rinnenota Satisfaction Questionnaire A five-point Likert scale which measures 20 dimensions of job satisfaction such as advancement, compensation, co-workers, schievement, independence, variety, etc. Scale can be accord to yield three scores: (1) total satisfaction, (2) intrinsic satisfaction, and (3) extrinsic satisfaction (Pritchard & Paters, 1974; Manous, 1973, 1974).

  Modular Assembly Small group assembly of an entire unit or a natural pare of a unit. Modular assembly usually implies self-pacing.

  Monotony is defined by Webster as sameness or lack of variety.

  Motion Economy Refers to formal principles associated with methods improvement that are concerned with the use of the human body, the work place layout, and the efficient design of tools and fixtures (Lehrer, 1958).

- Hotivating Potential Score A quantitative index of the degree to which a job will elicit high internal work motivation. Formula as follows: Skill Task Variety + Identity + Significance X (Autonomy & Feedback)

(Rackman, Oldham, Janson, & Pardy, 1975).

- \*\*Motivation Hygiene Theory Factors involved in producing job satisfaction are sensitis and distinct from factors that lead to working environment) are related to job dissatisfaction and content factors (achievement, responsibility) are intrinsic to the job center and cause assistation. Improving content factors (achievement, responsibility) are intrinsic to the job center and cause assistation. Improving content to the job center and cause assistation in content factors (achievement for producing to the job center and cause assistation broaders and the Scanlon which will be produced to the factors of the factors

a given position on a six-point scale form "0" (does not apply) to "5" (the highest scale value), or in some instances, on a dichotomous scale. "0" (does not apply) or "1" (does apply). (MCCOTRICK, Jeannerst. & Mecham, 1972) McCormick, 1974).

Preparation for Retirement Index A measure of the extent of preparation for Retirement Index A measure of the extent of preparation for Retirement Index A measure of the extent of preparation for Retirement in which the worker rates the importance of planning for retirement, indicates whether he has planned for retirement or if he will look for other work after retirement (Slood & Mulin, 1967).

Production Motivation Attitudes or feelings about the work itself and the work environment (Sorcher & Meyer, 1968).

Productivity Bargaining Cooperative negotiations between management and workers to improve the productivity situation to the satisfaction of management and workers. The objective is to increase the profit margin for the company and insure job security and earnings for the worker (Taylor, 1972).

Protestant State Constitution Eight tiem questionnaire measuring pre-protestant and con-protestant ethic (Mlood, 1969).

Protestant State Constituting agreement with Protestant Ethic. Scores were positively related to authoritarianism, internal control, Strong Vocational Interest Scales involving a concrete pragmatic approach to work and Scales of Sex Guilt and Hotorality Mirelis & Garrett, 1871).

Protestant Work Ethic Pefers to attitudes incorporated into an infiliudual's work value system that have overtones of the culture within which the individual has been raised. The ideals of this ethic are reflected in such attitudes as the belief that hard work brings rewards and that occupational achievement brings prestige (Blood & Hulin, 1967).

Quality of Mork Life Is a cubric used to refer to humanization of the work place, work place denocracy, work restructuring or job redesign (Cherns, 1975).

Involves four principles of humanization: (1) security, (2) equity, (3) individuation, (4) democracy (Davis, Cherns & Assoc. 1975s).

\*\*Postrictors\*\* Those workers who limit their production capacity so as not to exceed the production rate set by management (Naves. 1955).

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So as not to exceed the production rate set by management (Whyte, 1953).

Quota Particion Limitation on output or production by wasting time or galdbricking or adhering to a bogy standard of the production in a piece rate (Roy, 1951, 1952).

Late Easter Rate outer refers to those workers who produce above the group standards (Whyte, 1955).

Seducers Individuals who seek out and respond favorably to complex, Interesting and intense stimulus situations. These individuals reduce the kinesthetic aftereffect task, The opposite of reducers are augmenters (Sales, 1971, 1972).

Reference Test Tests or samples of more generalized abilities (e.g., spatial orientation control precision). Correlations between these reference tasks and scores on variations of criticinion tasks specify the ability requirements as a function of task variations (Fleishman, 1967a, 1967b, 1967c, 1967d).

netween these reference tasks and scores on variations of a criticrion tasks specify the ability requirements as a function of task variations (Pleishman, 1967a, 1967b, 1967c, 1967d).

Requisite Task Attributes (RTA) Rating of jobs by judges on following attributes: variety, autonomy, learning time, responsibility, required interaction, optional interaction. Judges rate the attributes on 9 point scales. See also Associated Task Attribute, Perceived Task Index, Perceived Opportunity to Contribute, and Bioh Task Index Jobs (Turner & Lawrence, 1965).

Retirement Attitude Scale Consists of two objective Likert-type questions and two open-end questions measuring a worker's satisfaction with cosing retirement. (Saleh & Otis, 1963).

Role Differentiation Differences between tasks carried out by group members.

Role Training Steps required to assure that employees fully understand how and why their individual jobs are essential to the success of the company where their own performance has on others (Sorcher, 1969; Sorcher & Meyer, 1968).

Satisfaction (Diocrepancy Theory) Discrepancy theory asserts that If major motives are satisfied in the context of work and career, then satisfaction with occupation should be a function of the variation between personal needs and the perceived potential of the occupation for satisfying these needs (Kuhlen, 1963).

Scientific Management The development of a science for each element of a man's work, which replaces the old rule of thumb method; the scientific selection, training and development of workers; cooperation with workers so that the work is done in accordance with the principles of the developed science; equal division of work between management and the worknen with management taking over the work they are fitted for (Taylor, 1911).

management taking over the work they are litted to the constitution management taking over the work they are litted to the constitution of time necessary to set up the operations (e.g., machinery) required for production to begin (Hill & Thickett, 1966).

Skill The level of proficiency on a specific task or limited group of tasks (Fleishmen, 1966, p. 148).

(machinery, plant layout, raw materials,) and a work relationa structure that relates the human operators both to the technology and to each other. Some technical systems involve three groups. Sentient (group for emotional support), task (group to complete task or service), and administrative (group which regulates relations between task and sentient systems) (Cooper & Foster, 1971).

Specialization Process whereby work activities become fragmented,

Specialization Process whereby work activities become fragmented simplified, and repetitive and limit the autonomy or discretion exercised by individual workers (Taveggia & Headley.

Spillover Model This model asserts that satisfaction with job
elements will be related ("spill over") to general life
satisfaction. The same spillover relationship holds for
job dissatisfaction and life dissatisfaction. An opposite
model is the compensatory one in which an individual can receive satisfaction in social activities (champoux, 1975a,
1975b; Iris's Barrett, 1972).

Srole's Anomic Scale Five item Likert-type scale measuring interpersonal alienation or "self to others belongingness" (Meier's
Bell, 1959).

Status Congruence Describes a condition in a small group in which
all the status attributes of one member hold the same rank
relative to the same set of attributes of every other member
(Susman, 1970a).

Structured Job Analysis A technique by which the human attribute
requirements of essential job elements can be identified.
An example of a structured job analysis instrument is the
Position Analysis Questionnaire (Marquardt & McCormick, 1972,
1974a, 1974b).

Suvey Mork Values Likert-type scale which consists of 6 scales
or dimensions of Protestant Work Ethic including (1) pride in
work, (2) job involvement, (3) activity preference, (4) attitudes
toward earnings, (5) social status at job, (6) upward striving
(Wollack, Goodale, Witjing, 6 Smith, 1971).

Task Dit of work which occupies a period of time between 15 minutes and an hour as compared to an operation or a batch
(Dickson, 1973).

A task consists of a stimulus complex and a set of instruc-

utes and an hour as compared to an operation or a batch
(Dickson, 1973).

A task consists of a stimulus complex and a set of instructions which specify what is to be done in relation to the
stimuli. The instructions indicate what operations are to
be performed by the subjects with respect to the stimuli and/
or what goal is to be achieved (Hackman, 1969e, 1969b).

Task Assessment Scales 15 scales of human ability requirements to
be used in the analyses of performance on various tasks and as
a system for classifying tasks (Theologus & Fleishman, 1973).

Task Characteristic Rating Scales 19 rating scales representing
standardized measures of physical properties of a task broken
down into five task components - goal, response, precedures,
stimulus, stimulus-response (Farina & Mhacton, 1971).

Task Flow Interdependence The degree to which individuals are
dependent upon each other to selve a problem which is moderated by task structure (Weinstein & Holzback, 1973).

Task Goal Attribute Questionnaire (TGAO) A 23 item-seven point
Likert-type scale measuring five task goal attributes.

(1) participation in goal setting; (2) feedback on goal difficulty;
(5) goal specificity (Steers, 1974).

Task-Qua-Task An approach that focuses on the physical properties
of the task as a stimulus which is presented to the individual
performing the task - the physical nature of the task, the
objective properties of a task (Hackman, 1969 b).

Task Structure Is a function of component complexity, component
organization, and component redundancy in which component
complexity is defined in terms of its information processing
and memory storage demands. Component organization is defined
in terms of similar demands imposed by the total task due to
interrelationships existing between or among task components.

Task redundancy refers to the degree of overlap existing
organizational teclinology is strongly related to organizational
organizational teclinology is strongly related to organizational
organizational teclinology is strongly related

Another classification system is as follows: (1) Operations technology - the equipping and sequencing of activities in the workflow, (2) Materials technology - characteristics of the materials used in the workflow, (3) Knowledge technology - characteristics of the knowledge used in the workflow (Hickson, Pugh, Pheysey, 1968).

(Bickson, Pugh, Pheysey, 1968).

Technology consists of the following categories: (1) Long-linked - a scrially interdependent set of tasks or operations analogous to a mass production assembly line, (2) Mediating this involves operating in atemlardized ways and sorting inputs or clients into groups (3) Intensive - a customized application of a variety of techniques to an object where the selection, combination, and application of techniques is determined through feedback from the object (Mahoney & Frost, 18-4) mediatrical and through feedback from the object (Mahoney & Frost, 18-4) and the object of the object of techniques and through feedback from the colect (Mahoney & Frost, 18-4) and object of of the object of the ob

Time Drag Overestimation of time in judging time (Kerr & Keil, 1963).

Time Staring The ability to utilize information obtained by shifting between two or more information channels (Levine, Romanhoo, & Fleishman, 1973).

Time Span of Discretion The longest period of time a worker can be on his own in balancing the pace and quality of his work without being reviewed by a supervisor (Kakson, 1973).

Traction Repetitive work can often have positively motivating characteristics. The pull to complete a batch of work can be pleasant. Traction can include: object, batch, line, and process traction (Smith & Lem, 1955; Turner & Michette, 1962).

Triple Ardit forming Garrey (TAMO) Measure of overall satisfaction, satisfaction with aspects of a job and needs of Individual (Lawis, Finto, & Dawis, 1972).

Urban-Bural (Operational) A general factor in studying the relationship between job satisfaction and performance characterized by the following situational variables: community size, number of employees in the division, union representation, average ways rate, and proportion of employees who are sale (Katzell, Barrett, & Parker, 1961; Blood & Hulin, 1967) Hulin, 1966a).

Vertical Dimension Refers to the degree to which the job holder controls the planning and execution of his job and participates in the setting of organizational policies (Lawler, 1969, p. 430).

Vertical Expansion Increasing the autonomy and responsibility of the employees for what he does and how he does it and in the setting of the control of the control

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Shood & Hulin, 1967; Hulin, 1966a).

Vertical Dirension Refers to the degree to which the job holder controls the planning and execution of his job and participates in the setting of organizational policies (Lawier, 1969, p. 430).

Vertical Expansion Increasing the autonomy and responsibility of the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does it and is office the epilyee for what he does and how he does at and is office the epilyee for what he does and how he does at and is on the epilyee for what he does and how he does at and is on the planning the plann

chosen (avoidant choice) and a total score that is the continuation of the two scores (Borgatta, Ford, 6 Bohrnstedt, 1973).

Mork Council In Sweden every company with more than 50 employees has a joint industrial work council hade up of representatives from sanagement and workers. Councils vary in functions from information and consultation to decision making in management areas (Tichy 6 Sandstrom, 1974).

Mork Irself An instrument, based on both theoretical considerations and field experience, used to examine satisfaction with the work itself by investigating responses to statements applicable to the following factor analytically based set of attitudes: (1) the work itself is interesting, (2) the job is not wasteful of time and effort, (3) I often feel the need for wore freedom in planning the job, (4) I have reasonable say on how my job is done, (5) the job provides opportunities, (6) the job provides feedback, (7) the job is too closely supervised, (8) it is not worth putting effort into the job (Ford, & Borgatta, 1970).

Mork Itself-Work Environment Questionnaire (MI/WE) An inventory of Interinsic and extrinsic properties of the job. The 19 Mork Itself-Work Environment Elements explored are as follows:

SERVED BY THE PROPERTY OF THE PERSON

(1) Work Itself Elements - variety, learning new skills (recessity and opportunity), follow-through, independence (methods and bace), goal clarity, internal feedback. (2) Work Environment Elements - interpressonal relations (supervisor and subordinates), external feedback, job/person fit, job security, work schedulinas, salary, company policy and administration, status inside the company, status outside the company, service to others (Cascio, 1973).

Work Sample Test Pre-employment test which reflects actual factors and task requirements relevant to the work situation in question (Farr, O'Leary, & Bartlett, 1973).

Work Shifts (1) Traditional Rota shifts have four crews, each working six or soven days on each of the three shifts (mornings, afternoons, and nights) in turn, with two or three rest days in between changes. (2) Continental Rota involves rapidly rotating systems where only two or three consecutive shifts of the same kind are worked with a 24 hour break between shift changes and a break of two or three days occurring at longer intervals (Poccok, Sergean, & Taylor, 1972).

Yale Job Inventory Likert-type scales measuring how much of the following six job attributes are present in a worker's job: (1) variety, (2) autonomy, (3) task identity, (4) feedback, (5) dealing with others, (6) friendship opportunities.

Other investigators (Stone, & Porter, 1975) have aided two

Other investigators (Stone, 6 Porter, 1975) have aided two more dimensions: (7) prestige of job compared to craft jobs, (8) prestige of job compared to all other jobs. Others (Lawler, Hackman 6 Kaufman, 1973) breakdown feedback into two-feedback from work itself and feedback from management.

Also measures a worker's affective response to a job including job involvement, internal work motivation, general satisfaction hygiene statisfaction, existence satisfaction, supervisory satisfaction, growth satisfaction, and peer satisfaction (Mackman & Lawler, 1971; Aldag & Brief, 1975b).

This is sometimes referred to in literature as Hackman Lawler (1971) Job Core Factors.

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